



## Safety Policy

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## Safety Policy Statement

It is the policy of Gartner Refrigeration & Mfg., Inc. to strive for the highest safety standard in all phases of operation and administration. It is our intention to provide safe and healthy working conditions and to establish and insist upon safe practices at all times by all employees.

Regard for the safety of the public, our own employees, and the employees of our customers and subcontractors is a supreme responsibility of all levels of our organization. It is, therefore, a basic requirement that each supervisor make safety an integral part of their regular management function. It is equally the duty of each employee to accept and follow established safety regulations and procedures. Prevention of injury and illness is a goal well worth achieving.

It is our intention to fulfill the requirements of the Minnesota Occupational Safety and Health Act. It is the obligation of all employees to be knowledgeable of the Standards established by this agency and to implement the rules and regulations contained therein. Every effort will be made to provide adequate training to employees. However, if an employee is ever in doubt about how to do a job safely, it is their duty to ask a qualified person for assistance.

Any injury that occurs on the job, however slight, must be reported to management as soon as possible. Any unsafe conditions must also be reported.

A safe operation is organized, clean, and efficient. If employees view safety as a serious matter, we will be in a better position not only to control accidents, but also to improve the total performance of the company. When you have an accident, everyone loses: you, your family, your coworkers, and the company. It is therefore of the utmost importance that all aspects of our Safety Program be strictly adhered to and that the intent of this program be followed to the letter. Any recommendations to improve our Safety Program are encouraged.

A handwritten signature in black ink, appearing to read "Bret C. Swanson".

Bret C. Swanson – Safety Director



## **A Workplace Accident and Injury Reduction Program (AWAIR)**

### ***Introduction***

At Gartner Refrigeration safety and health is part of every operation, and is part of every employee's responsibility --- at all levels. It is the intent of Gartner Refrigeration to comply with all laws concerning the operation of the business and the health and safety of our employees and the public. To do this, we must constantly be aware of conditions in all work areas that can produce or lead to injuries.

We need all of our employees' cooperation in detecting hazards, reporting dangerous conditions and controlling workplace hazards. The Job Supervisor or Foreman must be immediately informed of any situation beyond the employees' ability or authority to correct.

Employees will not be disciplined or suffer any retaliation for reporting a safety violation in good faith.

### ***Safety First Priority***

The personal safety and health of each employee is of primary importance. Each employee has an individual responsibility to prevent accidents. The prevention of accidents is of such importance, that employees are to notify their Supervisor or Foreman of any situation or condition that may present a safety hazard, including any known or concealed dangers in the work area. The company will then take immediate action to investigate the concern.

Gartner Refrigeration will make every effort to provide mechanical and physical protection for each employee's personal safety and health. However, employees bear the primary responsibility for working safely, performing their work as trained, and informing the Supervisor or Foreman of defective mechanical equipment and lack of physical and personal protection.

### ***Individual Cooperation Necessary***

Gartner Refrigeration shall maintain a safety and health program conforming to the industry practices. To be successful, our program shall instill a proper attitude toward injury and illness prevention on the part of management and employees. It requires cooperation in all safety, health, and production matters, not only between the employer and employee, but also between the employee, all co-workers, and the general public.

Therefore, it is the policy of Gartner Refrigeration that all employees protect the general public from hazards on our property or job site that may cause injury or illness to the general public. Following job procedures, using safe work practices and recognizing hazards identified in the Company Safety, Health and Loss Prevention Program effectively does this.

Only through such a cooperative effort can our safety, health, and loss prevention program be established and preserved in the best interest of all.

## ***Responsible Safety Person***

Our company management person who is responsible for our safety, health, and loss prevention program is Bret C. Swanson. This person has sufficient authority to implement the program. In addition to other titles, this person is called the Safety Director.

## ***Goals and Objects***

Gartner Refrigeration shall establish and strive to maintain a company culture committed to workplace safety and health. This will be done by:

- Reducing the risk of injury and illness.
- Minimizing property, equipment, and product damage.
- Compiling with the Federal, State and Local safety and health regulations.

## ***Safety and Health Responsibilities***

### **All Employees**

- Shall follow all safety rules at all times.
- It is extremely important that each employee understand how each task is done. If an employee does not know, he/she should stop work and ask a Supervisor, Foreman or the lead person at the job site.
- Notify Supervisor or Foreman immediately of unsafe conditions and acts.
- If an unsafe act or condition is seen, it should be reported to Supervisor, Foreman or lead person immediately. Safety is accomplished through effective communication, employee effort, common sense, and mutual support. Be familiar with and comply with proper safety and health practices.
- Use the required safety devices and proper personal protective equipment.
- Report all accidents/incidents to the Supervisor or Foreman immediately.
- Working safely is a condition of employment.

### **Safety Director Responsibilities**

- Provide all levels of management the services and technical advice needed for proper administration of the Safety Program.
- Develop technical guidance and intern programs to identify and remove physical hazards from construction sites.
- Formulate, recommend, and administer approved changes to the accident prevention program.
- Prepare and distribute to all department heads regular reports on the status of safety.
- Maintain adequate accident report system, personally investigating serious accidents and making corrective action to eliminate accident causes.
- Cooperate with project management personnel in the safety training of employees.
- Conduct personal inspections to observe unsafe conditions or work practices.
- Work to see to it that we are in compliance with Federal, State, and Local safety regulations.
- Recommend disciplinary procedures for repeated violators of safety rules.

### **Project Manager/Superintendent/Foreman/Supervisor Responsibilities**

- Be familiar with and enforce safety regulations applicable to company operations within area of responsibility.



- Discuss any current safety issues with their employees at the beginning of all regularly scheduled shifts.
- Correct and coordinate safety activities within their area of responsibility, to include motivation of employees for safe work practices.
- Require all employees under their supervision to utilize the proper personal protective equipment and job safety devices.
- See to it that safety equipment is available and storage locations are clearly designated.
- Conduct safety inspections of work areas, directs corrective action for unsafe conditions noted and inform the Safety Director of inspection results.
- Require all subcontractors to comply with applicable safety regulations.
- Provide information and recommendations to Safety Director concerning safety matters.
- Instruct all persons within area of responsibility in job safety and health requirements and insists on compliance.
- Assures that injuries are reported and treated promptly.
- Investigate all accidents, obtain all pertinent data, file a complete report with the main office, and review all accidents with the Safety Director.
- Assure that no unsafe conditions exist and report to the main office if any corrective actions, which are beyond their control, are needed.
- Conduct and/or supervise Job Site Inspection.

### **Office Manager/Clerk Responsibilities**

- Maintain all records of accidents that have taken place during company operations on forms designated by OSHA, insurance companies and other authorized agencies within seven calendar days of injury.
- Process all paperwork associated with accidents, onsite inspections, and in-house audits. Maintain permanent records as needed.
- Prepare all notices required by OSHA, State, Local, and other appropriate agencies for posting at each job site in accordance with designated regulations.
- The OSHA 300A summary will be signed by a Gartner official.
- Annual OSHA 300A summary will be posted from February 1 to April 30 and visible to employees.
- Recordkeeping of the forms will be maintained for 5 years.

### **Subcontractors Responsibilities**

- The provisions of these safety responsibilities apply to company subcontractors and their employees working on projects for this company.

## ***Hazard Identification and Control***

### **Hazard Identification Overview**

Hazard identification focuses on preventing loss from occurring. Hazard identification identifies physical hazards, work practices and other loss potentials likely to cause personal injury or property/product damage, so that corrective actions can be taken before a loss occurs. Methods used to identify hazards are:

## **Work Site Analysis**

Work site analysis is a proactive way to review the workplace to minimize hazardous conditions and improper acts. A functional work site analysis can be achieved in the following manners.

- Keep current on newly identified hazards in your industry and apply corrective actions as needed for your workplace.
- Assign and train a group of employees to review each highly hazardous job from time-to-time. The group will be taking a fresh step-by-step approach to detecting hidden hazards.
- Request feedback from employees on items appearing harmful.
- Review existing hazards controls.
- Use accident investigations reports to analyze what caused the accident and review standard operating procedures for possible changes.

## ***Standard Operating Procedures (SOP)***

Standard operating procedures maintain consistency in how a job is done by employees. All the factors that “complete the job” have to occur in a sequence of steps. These steps should be examined for hazards to make sure appropriate methods that control the hazards are in place. All hazardous jobs should have written standard operating procedures.

## ***Workplace Hazard Analysis and Control***

### **Safety Audits**

If possible, the foremen or his appointed person should conduct a weekly audit. As part of a safety audit routine, the Foreman will be alerted to unsafe conditions and acts. When reviewing the day’s work routine with the employees, the Foreman will point out conditions the employees may encounter.

### **Environmental Monitoring**

It is the responsibility of each individual employee to notify their Foreman if they have an indication there might be possible environmental concerns. In the event of a possible environmental concern the Foreman will notify the safety director immediately.

At this point, work will stop in the concerned area until the safety director and/or Foreman can do a complete on-site review. An analysis will be made at that time and if deemed necessary, an environmental testing agency will be contacted to offer a professional opinion for the correction of the situation.

All necessary monitoring devices, on-site personnel inspections and professional direction will be used to provide the utmost safe working conditions. When required or necessary, environmental monitoring will be:

- Included as part of all formal on-site inspection,
- Will be done on a daily basis by the Foreman or his appointed person and
- Will coincide with the daily on-site inspection.

## **Communication**

Gartner Refrigeration will communicate to our employees our commitment to safety; making sure employees are familiar with the elements of the safety, health and loss prevention programs.

Communication with employees will be:

- Through the Safety Director, Supervisor, Foreman or a designated employee
- By directions and statements,
- By written directives,
- By example and
- By this manual.

## **Accident Investigation**

All accidents shall be investigated, in a timely manner, to determine the cause of the accident and steps to prevent future accidents of this type from happening again.

Accident investigations forms and procedures are located in the appropriate section of the Safety & Health Manual.

## **Safety Committee**

A Safety Committee has been formed to help create and maintain an active interest in safety and reduce accidents. The policy of the Safety Committee is to:

Discuss and formulate safe policies and recommend their adoption by management.

Discover unsafe conditions and practices and determine their remedies.

Work to obtain results by having its management approved recommendation put into practice. Teach safety to all employees of the Company.

The Safety Committee meets at such times as called by the Chairperson. Meetings will be conducted according to the generally accepted rules of order, and minutes will be kept of all meetings.

## **Enforcement of Safety Policies**

Employees who willfully violate safe work practices and procedures will be subject to disciplinary actions.

**Employees whose willful violations could cause or lead to a serious injury are subject to immediate dismissal from employment.**



## Safety Rules

All employees, contractors and visitors working in or upon Gartner Refrigeration and/or Customer's premises must follow these safety rules.

1. No employee shall remove or modify any protective guards on any machinery without prior approval of the employee's immediate supervisor. Violation of this rule could mean immediate dismissal.
2. No open-style shoes, such as sandals or thongs, are allowed. Shoes must cover the entire foot.
3. All aisle ways should be kept clear at all times
4. The style of dress should be appropriate to performance of the job.
5. No smoking is allowed in certain designated areas
6. Approved safety glasses or eye/face protection, must be worn at all times when cutting, grinding, drilling or using hammer, everywhere beyond the office area.
7. The following are prohibited on plant property, including roads and parking lots:
  - a. Fighting
  - b. Horseplay
  - c. Consuming and/or being under the influence of intoxicants or illicit drugs.
  - d. Riding or standing on carriers, conveyors, buggies, hand trucks and motorized equipment, other than those designed for riding or stand on purposes.
  - e. Running (except in case of fire, imminent danger, and recreational activities in designated areas).
8. Hearing protection is required when working in compressor rooms or in areas designated by signs.
9. Hard hats must be worn:
  - a. On all construction jobs
  - b. In overhead crane areas
10. Ladders must be secured carefully at start of work.
11. A Personal Fall Arrest must be worn whenever working 6 or more feet from the ground or other working surface, when other Fall Protection System are not used.
12. All fork truck drivers must successfully complete training and obey basic RULES for fork truck use (no speeding, no riders, etc.).
13. No smoking in designated "No Smoking" areas, hazardous waste transport vehicles or around flammable materials or solvents.
14. Fire extinguishers must be located near all work areas.
15. No eating in process or laboratory areas.
16. Firearms, ammunition and other explosive items are prohibited within all work areas.
17. Proper respiration protection equipment must be worn when the 8 hours Time-Weighted-Average (TWA), for the exposed chemical, is greater than the NIOSH exposure limit for that chemical.
  - a. Ammonia parts per million (ppm) levels (50 ppm) must be checked with MSA "Kwick-Draw" tube instrument or other certified instrument.
  - b. The type of respirator equipment must be certified for the exposed to.
  - c. At concentrations less than the "Permissible Exposure Level" (PEL) set by NIOSH no respiratory equipment would be necessary.

- d. If ammonia smell is noted when using a respirator, check the respirator for proper fit and check for proper filter. If ammonia odor is still present, DO NOT use the respirator.
  - e. If ammonia ppm levels over 500 ppm (IDLH) a SCBA (Self Contained Breathing Apparatus) along with an encapsulated suit is required.
18. "Confined Space" entry permits are required for personnel to work inside tanks or covered sumps. Only trained personnel may enter confined spaces.
  19. No personnel are allowed on the truck dock floor when trucks are backing in without first sealing off and marking the area.
  20. "Work in Process" areas must be cordoned off or denoted with signs or cones.
  21. Identify contents of all liquid / chemical containers, including personal drinking utensils.
  22. Barricade or clean up and/or post appropriate warnings for all spills, leaks of liquids or lubricants on floor, loose materials, and/or suspended loads.
  23. Lockout switches must be used only for maintenance, not control. Only personnel who have been trained and verified on the safe operation of high-energy breakers and switches are authorized to operate them.
  24. Procedures specified in the lock-out/tag-out policy must be followed.
  25. All accidents and/or injuries must be reported immediately to your supervisor.
  26. Never block access to safety showers, exits, electrical switches and fire and emergency equipment.
  27. Employees are responsible for the proper maintenance and storage of personal protective gear.
  28. For automobile travel on company business, seat belts must be worn; also use shoulder harness, if installed.
  29. Employees are responsible for adhering to all safety regulations specified in the Gartner and/or MCA (Mechanical Contractors Association) Employee Training Manual.
  30. The following information shall be posted at construction job site:
    - a. Job Safety and Health Protection
    - b. Emergency Telephone Numbers



## Refrigeration Systems Safe Practices

### ***Anhydrous Ammonia (NH<sup>3</sup>)***

When working on systems containing Anhydrous Ammonia the following safety precautions shall be followed. The foreman shall perform a hazard analysis and give a safety talk to employees covering this procedure, ammonia exposures and conditions pertaining to their work activities. Site specific emergency plans will be discussed. This training shall be documented on the weekly tailgate form.

#### What is Anhydrous Ammonia?

- Ammonia gas is lighter than air.
- It is not a cumulative poison.
- It has a distinctive, pungent odor that even at low concentrations is detectable.
- Is self-alarming, it serves as its own alarming agent. No person will voluntarily remain in concentrations that are hazardous.
- It is extremely hard to ignite under normal conditions.
- It is a very stable compound.
- Ammonia can cause burning of the eyes and skin.
- It can cause temporary blindness, blindness, coughing, chest pains and dizziness.
- If ammonia is inhaled it can cause burning of the nose, throat and lungs

Note: Ammonia can form ignitable mixtures with 16% to 25% air; avoid sources of combustion.

#### Possible exposures points to Anhydrous Ammonia while working on a refrigeration system?

- Leaking valves on system
- Purge points
- Relief valves
- Replacing valves
- Ammonia tanks
- Draining oil
- Valve flanges
- Compressor shaft seals
- Overhauling compressors

### ***Safe Practices:***

- Ensure that exhaust ventilation equipment is adequate
- Provide emergency lighting as required, the use of explosion proof lights may be required when risk of explosive atmosphere is present
- When entering confined spaces comply with Company approved confined space procedures
- Make sure compressor and lubrication temperatures are within manufactures limits
- Avoid standing on refrigeration piping

- Eliminate excessive piping vibration immediately
- Maintain guards on all equipment
- Never valve off a vessel filled with liquid refrigerant, unless it is protected with a properly sized relief valve
- Never expose refrigerant vessels, drums or bottles to excessive heat
- Liquid refrigerant pumps should have a properly sized relief valve whether positive or centrifugal type to protect against excessive pressure
- Before starting the project designate areas where employees will assemble in case of an ammonia release. Know the areas where shut off valves are located, emergency phone numbers and evacuation routes
- Make sure fire extinguishers are filled and have current inspection certificates
- Remove sources of combustion
- Wear all the required personal protective equipment (PPE) When required by the owners specification or there is a possibility of contamination the use of chemical resisting gloves, goggles, rubber impervious outer wear and a respirator or self contained breathing apparatus may be required. These items will be discussed at the pre job safety set up meeting
- When respirators or SCBA is required assure that employees comply with Company respirator program
- Isolate areas where work is being performed to alleviate foot or motor traffic
- Always confer with the plant maintenance manager before commencing work activities or instituting our Lockout/Tag out programs

Note: When performing tie ins in refineries and food processing or beverage facilities, have a pre shutdown safety meeting and review PPE, Lockout /Tag out and rescue gear requirements

### ***First Aid:***

*Note: Keep an irrigation bottle available containing 2½ % each of borax and boric acid in distilled water*

### **Gassing**

- Remove any affected personnel into fresh immediately
- Get medical attention immediately
- Remove any clothing saturated with ammonia
- Keep the patient still and warmly wrapped in blankets
- If breathing fails give CPR

### **Liquid Splashes or Concentrated Vapors in Eyes**

- Irrigate eyes immediately with a solution of 2 ½% each of borax acid and boric acid in distilled water and continue for at least 15 minutes
- Get medical help immediately

### **Skin Burns from Splashes or Concentrated Vapor**

- Wash immediately with large quantities of water and continue for at least 15 minutes, removing all saturated clothing
- Get medical help immediately

- After washing, apply wet compresses solution of ( 2 ½% borax and boric acid in distilled water) to affected parts until medical attention is available

General Note: Comply with all Company and Owner safety rules and policies, document all training. Report all unsafe conditions to the General Foreman





## **Return to Work/Light Duty Program**

Gartner Refrigeration would like all employees that have been injured on the job to return to work as soon as possible. This will minimize lost time and income for the employee and reduce Workers Compensation Insurance premiums and overhead costs for Gartner Refrigeration. In order to reach this goal, the following steps will be taken.

### ***First Report of Injury***

- a. The "First Report of Injury" form will be completed by the employee and turned in to Julie Malek within 24 hours so that it can be forwarded to our insurance carrier in a timely manner.
- b. The "Supervisor's Report of Occupational Injury or Illness" form will be completed by the injured employees supervisor and turned in to Julie Malek. Any possible follow up action will be taken to educate employees on unsafe acts and conditions and to avoid future injuries.
- c. The "Return to Work Authorization" form will be required from the employees' physician and returned to Julie Malek.

### ***Return to Work***

- a. When the "Return to Work Authorization" form is received from the employee's physician, the work restrictions will be evaluated.
- b. When the physician has authorized a return to work, duties will be assigned to the injured employee that comply with any physical restrictions or time limits.
- c. Possible light duty positions include, but are not limited to: inventory maintenance, small tool repair and shop maintenance. Office employees may be given light clerical duties or phone work.
- d. Upon the physician's approval, the employee will return to full duties at his regular position.



## Electrical Safety

Safe work practices as defined by the National Fire Protection Association (NFPA) 70E Standard and the National Electrical Standard (NEC) Handbook shall be used to prevent electric shock or other injuries resulting from either direct or indirect electrical contacts, when work is performed near or on equipment or circuits that are or may be energized.

Lockout/tagout specific safe work practices shall be used and be consistent with the nature and extent of the associated electrical hazard. Lockout/tagout should identify the person who is performing the task and should be used when:

- Working near or on de-energized parts,
- Working on or near energized parts,

This section will not discuss electrical safety for employees who are classified as a Qualified Electrical Person.

### ***Definitions***

*De-energized parts* – Parts or equipment on which the energy source is disconnected by means of lockout/ tagout or a live part that operates at less than 50 volts to ground if there will be no increase exposure to electrical burns or explosion due to electric arcs. Equipment or machines that have not been locked or tagged out will be considered energized.

*Energized parts* – Parts or equipment when the energy has not been disconnected or where the energy has been disconnected and lockout/tagout is not used.

*Ground Fault Circuit Interrupter* -- A device for the protection of personnel that will de-energize a circuit when the circuit is overloaded.

*Qualified Person* – 1. A person that is trained in the operation of exposed energized and the hazards involved. 2. An employee who is undergoing on-the-job-training, who, in the course of such training, has demonstrated the ability to perform duties safely at their level of training and who is under the direction supervision of a qualified person.

*Unqualified Person* -- A person that is familiar with the construction and operation of exposed energized equipment and the hazards involved. They have received minimum training working with or near exposed energized equipment.

### ***Safe Working Practices***

Only qualified persons may work on electric circuits, parts or equipment that have not been de-energized. Such persons shall be familiar with the use of special precautionary techniques, personal protection equipment, insulating & shielding materials and insulated tools.

When working under overhead power lines, the lines shall be de-energized and grounded or other protective measures shall be provided before work is started.

- If the lines are to be de-energized, arrangements shall be made with the person or organization that operates or control the electric circuits involved to de-energized and ground them.
- If protective measures, such as guarding, isolating or insulating are provided, these precautions shall prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools or equipment.
  - An qualified person working in the area may not approach or take any conductive object without an approved insulating handle closer than five (5) feet of the overhead line unless:
- When gloves, with sleeves if necessary, rated for the voltage involved are considered to be insulation of the person from the energized part on which work is performed, or
- The energized part is insulated from all conductive objects at a different potential and from the person, or
- The person is insulated from all conductive objects at a potential different from that of the energized part.
  - Any vehicle or mechanical equipment capable of having parts of its structure elevated near an energized overhead line shall be operated so that a clearance of ten (10) feet is maintained. If the voltage is higher than 50kV, the clearance shall be increased by four (4) inches every additional ten (10) kV. Exception are:
- If the vehicle is in transit with its structure lowered, the clearance is reduced to four (4) feet and shall be increased by four (4) inches every additional ten (10) kV if the voltage is higher than 50kV.
- Minimum approach distance for qualified employees shall be followed per 29 CFR 1910.333(c)(3)(ii)(C) Table S-5

Table S-5 – Approach Distances for Qualified Employees – Alternating Current

Voltage Range (phase to phase)	Minimum approach distance
300V and less.....	Avoid Contact
Over 300V, not over 750V.....	1 ft. 0 in. (30.5 cm),
Over 750V, not over 2kV.....	1ft. 6 in. (45 cm),
Over 2kV, not over 15kV.....	2 ft. 0 in (61 cm),
Over 15kV, not over 37kV.....	3 ft. 0 in. (91 cm),
Over 37kV, not over 87.5kV.....	3 ft. 6 in.(107 cm),
Over 87.5kV, not over 121kV.....	4 ft. 0 in. (122 cm),
Over 121kV, not over 140kV.....	4 ft. 6 in. (137 cm)

- If properly rated insulating barriers are installed to prevent contact with the lines and are not part of the vehicle.
- Employees may not enter areas containing exposed energized parts unless illumination is provided enabling the employees to work safely.
- When working in confined spaces --- protective shields, barriers or insulating materials shall be provided as necessary.
- In work areas where conductive materials and equipment are in contact with any part of an employee's body --- the use of insulation, guarding and materials handling techniques will be used to minimize the hazard.
- Portable ladders must have non-conductive side rails.
- When working around exposed energized equipment --- rings, metal watchbands and jewelry will not be worn. Long hair must be worn about the head or covered with a cap or hair net.

- Cleanup and other housekeeping duties must not be performed if such duties present an electrical contact hazard.
- When work is performed near a qualified person, a safe distance or a barrier shall be established based on the NFPA 70E Standard.
  - An unqualified person working in the area may not be closer than or bring any conductive object closer than ten (10) feet of any work area that is not de-energized. If the voltage is higher than 50kV, the distance shall be increased by four (4) inches every additional ten (10) kV.

### ***Ground Fault Circuit Interrupters (GFCI)***

Ground fault circuit interrupters will be provided on all job sites for all 120 volt, single-phase, 15 and 20-ampere receptacle outlets that are not part of the permanent wiring of the building or structure.

- Receptacles on the ends of extension cords are not part of the permanent wiring and therefore must be protected by GFCI whether or not the extension cord is plugged into permanent wiring.
- All tools must be double insulated or a GFCI must be used.
- GFCI must be tested before each use.

### **Assured Equipment Grounding Conductor Program**

On construction sites where Ground Fault Circuit Interrupters cannot be used, the following Assured Grounding Program will be implemented and the Safety Director or his/her designated person will be the program responsible person.

This program applies to 120 volt, single-phase, 15 and 20-ampere receptacle outlets that are not part of the permanent wiring of the building or structure and equipment connected by an extension cord. All defective equipment will be tagged "Out Of Service." If the equipment is repaired a qualified individual must certify that the equipment may return to service.

A daily visible inspection of all cords sets shall be made.

### **Testing**

Extension cords and equipment will be tested by a competent worker as follows:

- Receptacle Tester – plug in to show if terminals are correctly connected to ground and if wire is continuous with no breaks.
- Continuity Tester – check if ground is continuous from metal frame through cord to third prong. Also touch tester to ground prong to detect possible ground fault.

Testing will be done before initial use, after any repair work or when damage is suspected and every three months. A record will be made of the test and color-coded tag or tape, to identify in which month the test was conducted (see below), attached to the cord.

<b>January</b> – <i>White</i>	<b>February</b> – <i>White + Yellow</i>	<b>March</b> – <i>White + Blue</i>
<b>April</b> – <i>Green</i>	<b>May</b> – <i>Green + Yellow</i>	<b>June</b> – <i>Green + Blue</i>
<b>July</b> – <i>Red</i>	<b>August</b> – <i>Red + White</i>	<b>September</b> – <i>Red + Blue</i>
<b>October</b> – <i>Orange</i>	<b>November</b> – <i>Orange + Yellow</i>	<b>December</b> – <i>Orange + Blue</i>

## ***Electrical Safety Rules***

- Tools and equipment should always get their power through a Ground Fault Interrupter Circuit (GFIC).
- Electrical equipment must be visually inspected for damage and defects before each day's use. Any damaged or defective equipment must not be used until repaired.
- Always use grounded plugs on equipment. Do not cut the grounding lug off of any plug.
- Make sure the electrical requirements of your equipment match the outlet power rating.
- All power cords must be of the approved type and must be properly insulated according to applicable codes.
- When running any temporary cords across aisles, cover them with an approved trip reducing device or material. Any cord in place for more than two working days is not temporary.
- A cord is not deemed serviceable if any of the interior conductors have their insulating jacket cut or torn.
- Conductive items of jewelry or clothing shall not be worn.
- Do not patch cords with electrical or duct tape.
- Extension cords cannot be spliced together.

## ***Training***

The type of training shall be of the classroom or on-the-job type and the degree of training provided shall be determined by the risk to the employee.

### **Unqualified Person**

Unqualified Person training should include:

- How electricity works
- How electricity can contact and harm the human body,
- Training in safe related work practices that pertain to their respective job assignment,
- How to perform lockout/tagout procedures on equipment so it can be worked on safely,
- Working with electric equipment and the electrical hazards involved with the work being performed,
- How to distinguish and identify exposed electrical equipment and energized parts,
- Clearance distances when working on or near energized equipment.
- How to identify potential electrical hazards and
- How to use equipment and machinery that is powered by electricity.

### **Retraining**

Retraining shall be provided when the following are noted:

- When there is reason to believe an affected employee, who has already been trained, does not have the understanding and skill required to work safely and
- When workplace changes present a hazard for which employees have not been trained.

## ***Certification***

Any employee who faces the risk of an electrical shock that is not reduced to a safe level shall receive training by a competent person. Training will address the type of hazards that may be encountered and safety controls to minimize those hazards.

All documentation shall bear the names of the employees trained, the date of the training and the name, signature and title of the person who conducted the training.

All documentation is maintained in the employee personnel file, located in the main office.



## Lock Out/Tag Out Program (LO/TO)

Gartner Refrigeration has established a written safety program applying to work on any machine or equipment where there is the potential for unexpected energizing, startup, or release of stored energy from electrical, mechanical, thermal, gravity, or material flow equipment.

The program consists of an energy control program, periodic inspections, and employee training, and has been put in place to ensure that machines are effectively locked out, tagged out, and in a Zero Energy Potential (ZEP) before any employee performs any servicing, maintenance, or demolition on that equipment.

Although an electrical subcontractor will usually handle the lock out, tag out, for electrical devices, company personnel need to be aware that the LO/TO program also applies to many other areas of our work. These areas include all of the following:

- Any hydraulic equipment (mechanical concrete buggies, etc.)
- Any lines that have pressure built up in them (standby fire lines, etc.)
- Any rigging that is under tension
- The concrete buckets that are spring loaded
- The come-along that are used to tweak a forming system
- The pneumatic powered tools (Jackhammers, etc.)
- Any powder activated power tools
- Any equipment that is under tension and could release all of its energy and strike you if it were to break
- Or any equipment that could cause a pinch to occur (Forks of a forklift being lowered, an engine that is being turned over which catches, etc.)

### ***Definitions***

***Affected Person*** is a person who may work or is working in an area when lockout/tagout is being performed.

***Authorized person*** is a person who has the authority to lockout/tagout a potential energy sources.

***Lock out*** is defined as the placement of a locking device that prevents the equipment from being operated until the locking device is removed. The locking device is considered an item that only the installer can remove. (A padlock is a locking device; a sign or tape is not.)

***Tag out*** is a sign that identifies who installed the lockout device, so they may be contacted in case of emergency.

***Energy source*** means any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy, including gravity.

## ***Lock Out***

All employees are required to comply with the rules governing the use of the lock out/tag out procedures.

- The company will provide the lock out, tag out, devices for securing, isolating, or blocking of machines or equipment from their energy sources.
- These devices may only be used for lock out/tag out situations.
- These devices must be strong enough to prevent their removal without the use of excessive force.
- The tag out devices must include a message about the hazardous conditions such as, 'Do Not Start', 'Do Not Open', 'Do Not Close', etc.
- The tag out devices must include the name of the person placing the lockout device.

## ***TagOut***

If a lock out device cannot be used, then a tag out system must be utilized. The tag out device must be attached as close to the location that the lock out device would have been attached. One or more of the following measures must also be taken:

- Removal of an isolating circuit element
- Blocking of a control switch
- Removal of a valve handle
- Blocking of the equipment control panel
- Locking of the access door to the controls
- Proper training of the affected individuals

## ***Inspection***

Documented inspections of the lock out/tag out program must be conducted at least yearly. A senior employee who knows but is not using the program must perform this inspection. (e.g., Superintendent inspecting his or her employees' program).

## ***Equipment***

Lockout/tagout equipment will be made available to employees who are authorized and trained in LOTO procedures.

### **For Construction**

1. Use "Lock Out Key Box"
  - **Inside Box:** Place official safety lock out padlock key. This can be customers or Gartner's blue safety padlock.
  - **Outside:** 3 locks; customer, electrician, and Gartner blue safety lock
    - **Goal:** Customer, electrician and Gartner Foreman are informed about unlocking and placing system on line.
2. Use chains lock and tags on valves to be kept closed during pump down and cut in.
3. Only the job supervisor will have keys to Gartner blue safety locks.

### **For Service**

1. Use Gartner orange padlocks, chain and tags on all valves that you have shut while working on the ammonia system.



If work continues for more than one shift, the control of the lock is passed on to the individual on the second shift or that employee will place their LOTO device on the piece of equipment in repair.

- The second shift employee must ensure the equipment is still in the zero energy state.
- Any change made by either shift must be communicated in person to the other shift.

### ***Emergency Lock Out/Tag Out Removal***

Lock out or tag out may be removed by a management person, using the emergency master key only when:

- Conditions exist that may jeopardize plant and/or personnel safety.
- The employee performing the work cannot be located after a reasonable period of time and every effort has been made to locate the individual responsible for the lock out/tag out equipment prior to the removal of locks/tags.

If the lockout or tag needs to be removed, then the following procedures must be followed:

- The Supervisor must follow the procedure the employee was using from start to finish to ensure all steps were completed.
- The Supervisor must inform all employees in the area that the equipment needs to be energized and ask if there are any reasons that it should remain shut down.
- The Supervisor must take all other precautions.

### ***Sequence of Lock Out/Tag Out***

1. Notify all affected employees that servicing or maintenance is required on a machine or equipment and that the machine must be shut down and locked out to perform the work on it.
2. The authorized employee must identify the type, magnitude, and hazards of the energy the machine utilizes, and must know the methods required to control that energy source(s).
3. Deactivate the energy isolating device(s) so the machine is completely isolated from the energy source(s).
  - Electrical Lock Out
    - a) Have the operator stop the equipment.
    - b) If necessary, have an electrician or other qualified electrical person open the disconnect switch and verify ZEP.
    - c) Install your lock on the service disconnect.
    - d) Have the operator push the start button or device.
    - e) Personally look at the equipment to verify it is not running.
    - f) Have the operator push the stop button. **Do not push the start button again.**
  - Mechanical Lock Out
    - a) Have the operator shut down and secure the equipment.
    - b) The operator will close any valves needed to isolate product (i.e. stock, water, steam, chemicals, etc.) Close any valves needed to isolate hydraulic or pneumatic contact, and drain the system if necessary. *Note:* If there are not valves, install blinds or otherwise secure to ZEP.
    - c) Install your lock on each valve or blind. The Supervisor will install a system lock on the valve or blind.
    - d) Block any portion of equipment where movement (through release of pressure, gravity, mechanical breaks, etc.) could cause an injury and install necessary lock out device.
4. Work may begin.

5. When work is complete, remove your lock and Notify all affected employees that servicing or maintenance has been completed.

### ***Restoring Equipment to Service***

1. Check the machine or equipment and the immediate area around the machine to ensure that nonessential items have been removed, and the machine components are intact and in proper order.
2. Check the work area to ensure all employees are in an area of safety.
3. Verify the controls are in neutral.
4. Remove all lock out/tag out devices and re-energize the machine or equipment.
5. Notify the affected employees that the machine is ready for use.
6. Check to ensure the machine is operating correctly.

### ***Group Lock Out/Tag Out Procedure***

When more than one authorized person is involved in a lockout/tagout situation, the following provisions need to be observed.

- One authorized person will be designated overall responsibility and authority for the lockout/tagout.
- The lockout/tagout procedures will be reviewed with all group members.
- If more than one or contractor is involved, a single employee must be selected as being ultimately responsible for the lockout/tagout.
- Each authorized employee will affix his or her lockout/tagout device, with identification, to the group lock. As each authorized employee finishes their work and no longer requires lockout/tagout protection, their lockout/tagout device can be removed.

### ***Shift or Personnel Changes***

Shift changes and personnel changes, will be coordinated by an authorized person in charge of the group or individual lockout/tagout. This will include:

- Changing locks and/or tags from off-going to on-coming authorized employees,
- Retesting to ensure equipment or machinery being serviced is de-energized, and
- Informing on-coming employees of the changes in the job that effects the lockout/tagout procedures.

### ***Special Procedures***

There are some routine maintenance and operation procedures into which the above procedures cannot be applied. In every case, necessary precautions will be taken to ensure the safety of personnel.

- In instances where any machine must be in motion for proper adjustment. Testing or repairs to be done, the following precautions must be observed:
  - a) The machine must be operated at slow or jog speed.
  - b) Extension tools, which minimize personnel exposure, must be used where possible.
  - c) The operating controls must, at all times, be under the direct control of a qualified operator or crafts worker.

- d) All personnel must remain in view of the operator or other means of communication must be established whenever possible.
- Local safety disconnect switches may, in special situations, be used as alternate means to isolate an electrical power source.

### ***Long Term Lock Out/Tag Out***

Construction activities that requiring a long term lock out will be permitted by placing a prestart-up lock with an informational tag (or sign in a large area) signed by the key holder stating:

- The reason for the lock out
- The duration of the lock out
- The key holders name and 24-hour phone number

### ***Training***

Training must be provided to all employees to ensure everybody understands the purpose and function of the LO/TO/CO program.

Training must be given to the employees actually using the LO/TO/CO program, which must include the following:

- Recognition of energy sources, type and magnitude of those sources of energy, and the method needed to control and isolate those sources by the use of the lock out/tag out program
- Safe working rules
- Electrical safety rules
- Safe working procedures
- The proper sequence to follow to lock out/tag out a piece of equipment
- The proper sequence to follow to restart the equipment

The “DANGER” tag alone is to be considered a direct warning notice. It is to be obeyed and any equipment bearing such a tag MUST NOT BE OPERATED UNDER ANY CIRCUMSTANCE.

### ***Retraining***

Retraining is required when there is a change in job procedures, a change in the energy control procedures, or when a new hazard is introduced.

### ***Certification***

All documentation shall bear the names of the employees trained, the date of the training and the name, signature and title of the person who conducted the training.

All documentation should be maintained in the employee personnel file, located at the main office.

**It is the company policy that locks be used in conjunction with tags for all lockout/tagout procedures.**

## ***Equipment/Task Specific LOTO Procedures***

### **Reciprocating and/or Screw Compressors**

#### Start-Up Sequence

- a. Remove tags and locks on electrical.
- b. Any water necessary for the operation of the system should be turned on. Re-install and remove tags.
- c. Open suction and discharge service valves, also liquid injection and economizer service valves, if applicable.
- d. Close disconnect switches for compressor, motor and oil pump starters.
- e. Turn on oil heater circuit breaker.
- f. Perform checkpoints on manufacturer's pre-start checklist, then start unit.

#### Shut Down Sequence

**For seasonal or prolonged shut downs, the following procedure should be followed:**

- a. Reduce the system pressure to the desired condition.
- b. Turn/Press STOP button/key to cease operation of the compressor.
- c. Open disconnect switches for compressor motor and oil pump starters.
- d. TAG & LOCK OFF (\*)
- e. Turn off oil heater circuit breaker.
- f. Close suction and discharge service valves, also liquid injection and economizer service valves, if applicable. Attach CLOSED TAGS & LOCK (\*).
- g. Protect oil cooler from ambient temperatures below freezing. Shut off cooling water supply valve to oil cooler, if applicable or remove water heads. Attach CLOSED TAG and LOCK (\*).

### **Evaporator Coils**

#### Start Up Sequence

- a. Turn on electric for fans
- b. Check fans operation for correct direction
- c. Open suction valve
- d. Open liquid valve
- e. Open hot gas valve remove tags
- f. Check hot gas defrost pressure regulator operation. Note: factory set at 75 psig
- g. Check temperature and defrost setpoints, confirm calibration

#### Shut Down Sequence

- a. Close liquid shut off valve
- b. Let fan run 5 minutes
- c. Shut electric disconnect - TAG and LOCK OFF (\*)
- d. Close hot gas shut off valve and TAG
- e. Close suction shut off valve and TAG
- f. Reduce pressure to desired condition

Note: For fan motor/blade and coil cleaning only

- a. Shut liquid solenoid or stop valve and TAG
- b. Shut hot gas solenoid or stop valve and TAG

- c. Shut electric disconnect
- d. TAG and LOCK OFF (\*)

## **Liquid Ammonia Pumps**

### Start Up

- a. Open suction valve slowly, look for leaks and then open fully
- b. Open liquid valve slowly, look for leaks and then open fully
- c. Remove Lock and Tag. Turn on electric disconnect

### Shut Down Sequence

- a. Shut electric disconnect
- b. TAG and LOCK OFF (\*)
- c. Close liquid valve and TAG
- d. Close suction valve and TAG
- e. Reduce pressure to the desired condition

## **Evaporative Condenser**

### Fans Motors & Water Pumps

- a. Shut electric disconnect
- b. TAG and LOCK OFF (\*)
- c. Remove Locks and Tags when work is complete

### Fans

- a. Turn on electric disconnect for fan. Check for proper operation and direction of rotation.
- b. Adjust fan cycle pressure range.
- c. Adjust fan to run primary before water

## **Water Pumps**

- a. Fill water tank
- b. Turn pump on manual.
- c. Adjust water pressure at condenser header to a maximum of 10 psig.
- d. Check to see that all spray nozzles are clear and directed at tube bundle

## **Electric Control/Solenoid Valves**

### Start Up

- a. Remove Lock and Tag
- b. Open valves
- c. Turn on electric disconnect/control circuit

### Shut Down Sequence

- a. Valve off up-stream pressure
- b. Valve off down-stream pressure
- c. Shut off zone disconnect - TAG and LOCK OFF (\*)

## **Electric Control/Solenoid Valves**

### Start Up

- a. Open valves cautiously
- b. Check for leaks
- c. Turn on electric disconnect/control circuit

- d. Check temperature and defrost control cycle operation
- e. Check defrost relief to 75 psig. Note: factory set at 75 psig



## Fall Protection

Fall protection is required whenever employees are exposed to fall from heights of six (6) feet or greater to a lower level. Protection will be by the use of Conventional Fall Protection (Personal Fall Arrest, System a Fall Protection System), or Alternative Fall Protection (Warning Lines, Fall Protection Plan)

### Definitions

Anchorage – A secure point of attachment for lifelines, lanyards, or deceleration devices.

Anchorage used for attachment of personal fall arrest equipment shall be independent of any anchorage being used to support or suspend platforms and capable of supporting at least 5,000 pounds per employee attached, or shall be designed, installed, and used as follows:

- As part of a complete personal fall arrest system which maintains a safety factor of at least two; and
- Under the supervision of a qualified person.

Body Belt – A strap with means both for securing it about the waist and for attaching it to a lanyard or lifeline. To be used for restraint or positioning work only, not for fall arrest.

Body Harness – Straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders, with means for attaching it to other components of a personal fall arrest system.

Controlled Access Zone (CAZ) – An area in which certain work may take place without the use of guardrail systems, personal fall arrest systems, or safety net systems; access to the zone is controlled.

Fall Arrest System – The use of multiple approved safety equipment components such as: body harness, lanyards, deceleration devices, drop lines and or vertical lifelines and anchorages interconnected and rigged as to arrest a free fall.

Fall Restraint – Any approved safety equipment components that function together to restrain an employee in such a manner as to prevent that employee from falling from the work surface such as: a standard guardrail system or body harness and lanyard that does not allow movement beyond the surface edge.

Free Fall – The act of falling before a personal fall arrest system begins to apply force to arrest the fall.

Guardrail Systems – A barrier erected to prevent employees from falling to lower levels.

Hole – A gap or void 2 inches (5.1 cm) or more in its least dimension in a floor, roof, or other walking/working surface.

Leading Edge – Any advancing edge of a floor, roof or formwork which changes location as additional flooring or roofing is placed, formed, or constructed. Leading edges not actively under construction are considered to be unprotected sides and edges and positive methods of fall arrest or fall restraint shall be required to protect exposed workers.

Lifelines – To be constructed of synthetic fibers such as nylon or rayon.

Low-Slope Roof – A roof having a slope less than or equal to 4/12 (vertical to horizontal).

Rake Edges – Any unprotected side, of which, is not a constant elevation.

Roof – The exterior surface on the top of a building. This does not include floors or framework, which, if a building has not been completed, temporarily become the top surface of the building.

Roofing Work – The hoisting, storage, application and removal of roofing materials and equipment, including related insulation, sheet metal, and vapor barrier work, but not including the construction of the roof deck.

Steep-Roof – A roof having a slope greater than 4/12 (vertical to horizontal).

Toeboard – A low protective barrier that will prevent the fall of materials and equipment to lower levels and provide protection from falls for personnel.

Walking/Working Surface – Any surface, whether horizontal or vertical, on which an employee walks or works.

## ***Conventional Fall Protection***

A fall protection system must be used to protect employees that are working on roofs with unprotected edges that are six (6) feet or more above the lower levels. Forms of fall protection systems and their requirements are as follows:

### **Guardrail Systems**

Must have an overall height of 42 inches (give or take 3 inches)

Must have a top and mid rail, and toe boards.

All rails must be a smooth surface rail, at least a minimum of ¼ inch thick.

If rails are made of a wire rope, than:

- It must be flagged with a highly visible material at an interval of not less than every six feet.
- The wire rope must be a minimum of ¼ inch thick.

The top rail must be capable of withstanding 200 pounds of pressure with a total deflection of no more than three (3) inches at a point within two (2) inches of the top.

### **Personal Fall Arrest Systems (Full-Body Harness and Lanyards)**

When employees are exposed to a fall hazard greater than six (6) feet, and are not protected by a Fall Restraint System (such as a guardrail), a full body harness and lanyard assembly shall be used.

Maximum arresting force on a person can be no greater than 1800 pounds. When the whole system is assembled, it shall allow the employee a freefall of no more than six (6) feet.

## ***Alternative Fall Protection***

### **Warning Line Systems**

When used, warning line systems must be set up according to the following provisions:

- Identifying the work area,
- Establishing a 15-foot perimeter that shall be 34 to 39 inches from the working surface, able to sustain a force of 16 pounds horizontally at the base and have a tensile strength of at least 500 pounds (e.g. yellow 1/4 inch nylon rope),
- No work or work-related activities is to take place in the area between the 15-foot perimeter and the roof edge,



- Employees are prohibited from going past the 15-foot perimeter.
- Appropriate staging of materials and equipment,
- Restricting access to areas below and adjacent the work area,
- Eliminating impalement hazards,
- Ceasing work during adverse weather conditions and
- Permitting only properly trained workers to use the alternative measure.

### ***Fall Protection Plans***

A Fall Protection Plan can be used only if it can be demonstrated that other Fall Protection Systems are not feasible, and/or would create a greater fall hazards.

The Fall Protection Plan must correspond with the following:

- Be prepared by a qualified, knowledgeable person and implemented by the same.
- Must be site-specific, up-to-date, and maintained at the worksite .
- Must designate by name or other means of identification, who is authorized to be in the work area.
- A competent person must investigate any accident promptly and modify the Fall Protection Plan accordingly.
- Establish a Safety Monitoring Person(s) or system.
- In the event of a fall, all available employees should assist in the prompt rescue of the fallen employee.

All accidents and serious incidents that happen when using a Fall Protection Plan must be investigated, implementing changes to the fall protection plan as necessary.

### ***Roof Openings and Towboards***

Openings, which are commonplace for such things as skylights and rooftop equipment, must be securely covered and marked or labeled as such.

- Securely covered is identified as nailed or screwed down, or attached so the wind, equipment, or employees may not inadvertently remove them.
- Marked or labeled is identified as color coded or marked with the word “hole” or “cover” to provide warning of the hazard.
- Covers, structurally, must be capable of holding twice the weight of any worker traffic that may be on it at any given time.

The proper covering and marking of rooftop openings is the responsibility of the General Contractor.

- All rooftop openings should be inspected prior to beginning the roofing operations, and if the rooftop openings are not deemed to be properly covered, the Supervisor or Foreman will see it is properly done, and will also notify the General Contractor of the situation.

Toeboards, when used as falling object protection, will be erected along the edge of the overhead walking/working surface for a distance sufficient to protect employees below.

- The toeboards will be capable of withstanding, without failure, a force of at least 50 pounds applied in any outward or downward direction.
- The toeboards must be a minimum of 3.5 inches in vertical height, and have not more than ¼ inch of clearance above the working surface.

- The toeboards must be solid or have openings not more than 1 inch in greatest dimension.

## ***Training***

Any employee who is exposed to a fall hazard shall receive training by a competent person who is knowledgeable in the nature of:

- fall hazards associated with the job,
- fall protection systems,
- the use of personal protective equipment and
- the handling and storage of equipment and materials.

Training will address the prevention and protection against fall hazards as well as outline safety systems to be utilized for the hazards involved. This training shall enable each employee to recognize the hazards of falling and in the procedures needed to minimize these hazards.

Employees who are covered under a Fall Protection Program shall be trained in alternate fall protection systems, in special fall hazards and in general fall safety as needed.

## **Specific Training**

When an employee is required to use fall protection equipment that they are not familiar with, or in a location that could pose additional hazards, they will receive specific training on the hazard.

This training will cover special equipment and procedures the employee needs to follow in order to safely perform the work.

## **Retraining**

Retraining shall be provided when the following are noted:

- There is reason to believe any affected employee who has already been trained does not have the understanding and skill required by this section,
- Work place changes and
- Fall protection systems or equipment changes that render previous training obsolete.

## **Certification**

All documentation shall bear the names of the employees trained, the date of the training and the name, signature and title of the person who conducted the training.

All documentation shall be maintained in the employee personnel file, located in the main office.

## ***Sample Fall Protection Program***

**THIS FALL PROTECTION PLAN IS SPECIFIC FOR THE FOLLOWING PROJECT:**

SITE LOCATION:

SITE ADDRESS:

SITE CITY:

COMPANY WORKING ON SITE:

PREPARED DATE:

Plan Prepared By

Plan Approved By

Plan Supervised By

*The following Fall Protection Plan is a sample program prepared for the prevention of injuries associated with falls. A Fall Protection Plan must be developed and evaluated on a site-by-site basis.*

### **STATEMENT OF COMPANY POLICY**

Gartner Refrigeration & Mfg., Inc. is dedicated to the protection of its employees from on-the-job injuries. All employees of Gartner Refrigeration & Mfg., Inc. have the responsibility to work safely on the job. The purpose of this plan is: (a) To supplement our standard safety policy by providing safety standards specifically designed to cover fall protection on this job and; (b) to ensure that each employee is trained and made aware of the safety provisions which are to be implemented by this plan prior to the start of erection.

This Fall Protection Plan addresses the use of other than conventional fall protection at a number of areas on the project, as well as identifying specific activities that require non-conventional means of fall protection. These areas include:

- A. Leading edge work.
- B. Unprotected sides or edge.
- C. Hoisting areas.

This plan is designed to enable employers and employees to recognize the fall hazards on this job and to establish the procedures that are to be followed in order to prevent falls to lower levels or through holes and openings in walking/working surfaces. Each employee will be trained in these procedures and strictly adhere to them except when doing so would expose the employee to a greater hazard. If, in the employee's opinion, this is the case, the employee is to notify the Foreman of the concern and the concern addressed before proceeding.

Safety policy and procedure on any one project cannot be administered, implemented, monitored and enforced by any one individual. The total objective of a safe, accident free work environment can only be accomplished by a dedicated, concerted effort by every individual involved with the project from management down to the last employee. Each employee must understand their value to the company; the costs of accidents, both monetary, physical, and emotional; the objective of the safety policy and procedures; the safety rules that apply to the safety policy and procedures; and what their individual role is in administering, implementing, monitoring, and compliance of their safety policy and procedures. This allows for a more personal approach to compliance through planning, training, understanding and cooperative effort, rather than by strict enforcement. If for any reason an unsafe act persists, strict enforcement will be implemented.

It is the responsibility of Gartner Refrigeration & Mfg., Inc., Superintendent and/or Foreman to implement this Fall Protection Plan. The Superintendent or Foreman are responsible for continual safety checks of their work operations and to enforce that safety policy and procedures are followed. They are also responsible to correct any unsafe acts or conditions immediately. It is the responsibility of the employee to understand and adhere to the procedures of this plan and to follow the instructions of the Foreman. It is also the responsibility of the employee to bring to management's attention any unsafe or hazardous conditions or acts that may cause injury to either themselves or any other employees.

## **FALL PROTECTION SYSTEMS TO BE USED ON THIS PROJECT**

Where conventional fall protection is infeasible or creates a greater hazard at the roof edge and during initial set up activity, a safety monitor system will be used. Specific areas are:

### **LIST SPECIFIC AREAS ACCORDING TO JOB**

1. On the (2) small rooftops on the north side of the building, a scaffolding system will be erected for the purpose of elevating the safety monitor to the same working height of the person performing the roofing operations.
2. A personal fall arrest system will be used when performing roofing operations on the asphalt shingle sections of the project utilizing anchorage points provided by ?????.
3. Where the parapet walls are in excess of 39 inches it will be utilized as a guardrail system.
4. On the upper roof, a safety monitor system will be used alone. This will be done in accordance with 29 CFR 1926.502(b)(10) because the roof is less than 50 feet wide.

Safety Monitor(s) \_\_\_\_\_

Employee _____	Employee _____
Employee _____	Employee _____
Employee _____	Employee _____
Employee _____	Employee _____

Only individuals with the appropriate experience, skills, and training will be authorized as roofers. All employees that will be working as roofers under the safety monitoring system shall have been trained and instructed in the following areas:

1. Recognition of the fall hazards in the work area (at the leading edge and when making initial connections-point of erection of safety equipment).
2. Avoidance of fall hazards using established work practices, which have been made known to the employees.
3. Recognition of unsafe practices or working conditions that could lead to a fall, such as windy conditions.
4. The function, use, and operation of safety monitoring systems, warning line systems, guardrail systems, body belt/harness systems (PFAS), control zones and other protection to be used.
5. The correct procedure for erecting, maintaining, disassembling and inspecting the system(s) to be used.

### ***Changes to Plan***

Gartner Refrigeration & Mfg., Inc. will approve any changes to this plan. This plan shall be reviewed by a qualified person as the job progresses to determine if additional practices, procedures or training needs to be implemented by the competent person to improve or provide additional fall protection. Workers shall be notified and trained, if necessary, in the new procedures. A copy of this plan and all approved changes shall be maintained at the worksite .

### ***Enforcement***

Constant awareness of and respect for fall hazards, and compliance with all safety rules are considered conditions of employment. The Supervisor or Foreman, as well as individuals in the Safety and Personnel Department, reserve the right to issue disciplinary warnings to employees, up to and including termination, for failure to follow the guidelines of this program.

### ***Accident Investigations***

All accidents that result in injury to workers, regardless of their nature, shall be investigated and reported. It is an integral part of any safety program that documentation take place as soon as possible so that the cause and means of prevention can be identified to prevent a reoccurrence.

In the event that an employee falls or there is some other related, serious incident occurring, this plan shall be reviewed to determine if additional practices, procedures, or training need to be implemented to prevent similar types of falls or incidents from occurring.



## **Hazard Communication/Right-to-Know**

### ***Hazard Communication***

#### **General Information**

In order to comply with 29 CFR 1910.1200 (Hazard Communication), the following written Hazard Communication Program has been established. The written program will be available in the office of the Safety Director at the company main office. Any employee may review this program in person at the aforementioned location or may obtain a written copy by submitting a written request, which is dated, signed, and contains a full return address.

#### **Container Labeling**

All manufacturers containers received for use will be clearly labeled;

- as to the contents,
- the appropriate warning hazard, including specific information regarding physical and health hazards, and
- the name and address of the manufacturer.

All secondary containers will be labeled with either an extra copy of the original manufacturer label, or with a generic label which will include;

- The chemical identity and hazard warning prominently displays in the English language.

Original labels on containers containing hazardous chemicals will not be removed.

If a different material is placed in a container, the label for the hazardous material contents must be changed to reflect the true contents in the container.

For non-English speaking employees, information shall be presented in their language.

The Safety Director will review the company labeling system yearly and update as required.

Portable containers for use on the job may be filled from larger containers and need not be labeled if;

- the chemical is drawn for immediate use,
- the hazardous chemical will be under the control of and used only by the person who transfers it from a labeled container, and
- the contents will be used-up within the work shift in which it is transferred.

### ***Material Safety Data Sheets***

The Safety Director will be responsible for obtaining and maintaining the MSDS system for the company. He/she will review incoming MSDS's for new and significant health and safety

information and see that any new information is passed on to all affected employees. MSDS's may be in a language other than English, although an English version shall be maintained.

Copies of MSDS's will be given to all Field Superintendents and a copy kept in the office of the Safety Director.

MSDS's will be available to all employees, as well as to other trades.

If MSDS's are not available or new chemicals in use do not have a MSDS's, the Safety Director must be contacted immediately.

- When ordering or purchasing materials and products not currently listed on the companies chemical inventory list, purchase orders should have attached a notice stating, *"This purchase is conditional upon receipt of an MSDS"*.

Employees will be trained to recognize and interpret MSDS's, labels, warnings, color-coding, and signs affixed to containers that they might handle.

Where employees must travel between workplaces during a work shift, (i.e., their work is carried out at more than one geographical location) the material safety data sheets may be kept at the primary workplace facility. In this situation, the employer shall ensure that employees can immediately obtain the required information in an emergency.

### ***List of Hazardous Chemicals***

A list of all known hazardous chemicals used by employees is contained as a separate section of the Company Safety Manual and located at the main office.

The hazardous chemical list will be updated as necessary to reflect the introduction or deletion of any chemical into or from the work place.

### ***Hazardous Non-Routine Tasks***

Periodically, employees are required to perform hazardous non-routine tasks. Prior to starting work on such projects, each affected employee will be given information about the hazardous chemicals to which they may be exposed. This information includes but is not limited to;

- specific chemical hazards,
- protective/safety measures the employee can take, and
- measures taken to minimize the hazards.

### ***Contractor and Adjacent Trade Notification***

The prime contractors and other trades who may be exposed to hazardous materials shall be informed as to:

- the nature of the hazard
- the location of the available Material Safety Data Sheets and
- the precautions their employees may take to minimize the possibility of exposure.

### ***Employee Information and Training***

The Safety Director shall ensure compliance with all elements of this section.

Prior to starting work, each new employee, will receive information on:

- hazardous chemicals use in the work process;
- information on operations that may utilize hazardous chemicals;

- the availability and use of various personal protective equipment;
- who to contact to answer questions about chemicals;
- the location and availability of the written Hazard Communication Program, and
- how to request Material Safety Data Sheets.

Prior to the first exposure to hazardous chemicals and whenever there is a potential for exposure to chemicals, employees will be trained on:

- the methods and observation that may be used to determine the presence of hazardous chemicals in the work area;
- the physical and health hazards of the chemicals in the work area;
- the measures that can be taken to protect employees from these hazards, including safe work practices, emergency procedures, and personal protective equipment that should be worn;
- Instructed in the known potential fire, explosion or toxic release hazards related to his/her job;
- how to read MSDS's and labels to obtain appropriate hazard information;
- how to locate the MSDS's and hazardous chemical list, and
- applicable provisions of the emergency action plan.

### **Documentation**

All Training shall be documented showing that each employee has received & understood the required training.

- Upon completion of *Right-to-Know* training, each employee will sign documentation to verify they attended the training, received a copy of the written Hazard Communication Program, and understand the company policy on hazard communication and chemicals.

Prior to the introduction of any new chemical hazard by the company into the workplace, each employee who may be at risk to exposure will be made aware of any and all pertinent information that will help minimize their risk.





## **Emergency/First Aid Procedures**

### ***Site Evacuation***

In the event of a worksite evacuation, a **RALLY POINT** (meeting area) shall be determined before work begins. The **RALLY POINT** shall be an area that is known by all personnel and shall be an area that is free from any foreseeable hazards.

Customers escape routes should be presented to each crew member at the start of each job.

The worksite lead person will conduct a physical accountability (head count) at the **RALLY POINT** of all workers to ensure no workers are unaccounted for. In any workers are unaccounted for, this information shall be relayed to the emergency responders as soon as possible.

### ***Fire***

- Obtain appropriate emergency equipment or services as required by the nature of the fire.
- Determine if the site must be evacuated. If an evacuation is necessary, have all workers meet at the **RALLY POINT**.
- Coordinate site access for emergency response personnel. Inform the fire department of the nature of the fire and of any known hazards, which they may encounter such as:
  - compressed fuel gas tanks,
  - unprotected floor openings, or
  - toxic materials present on site.
- Inform the fire department if any individuals are unaccounted for, give the last known location of the individuals to fire rescue personnel.
- Secure fire area. Close off job site if necessary.
- Arrange for monitoring of accident site or damaged equipment until a remedial action plan is developed.

### ***Property Damage/ Collapse***

- Determine if the site must be evacuated. If an evacuation is necessary, have all workers meet at the **RALLY POINT**.
  - Secure collapsed area or damaged equipment, and close off job site if necessary.
  - Report details of event and damage assessment to worksite lead person.
  - Arrange for monitoring of accident site or damaged equipment until remedial action plan is developed.
  - Refer all inquiries for information to Lead Person.

After remedial action plan is developed and approved by senior management, assure requirements are completed expeditiously

## ***Severe Weather***

The worksite lead person will monitor the weather and will immediately inform all workers and contractors if any danger is present, an announcement is made or local sirens are heard. If no alarm is heard the worksite lead person will make the decision as to whether work shall proceed.

## ***Hazardous Materials Release***

- Determine the nature and source of the hazard. Obtain appropriate emergency services as required.
- Determine prevailing wind direction and evacuate all personnel upwind of the hazard if necessary.
- Conduct physical accountability (head count) at RALLY POINT of all employees to ensure no personnel are missing
- Inform fire department or other agency rescue personnel of the type of hazard before they attempt a rescue effort
- Reroute traffic to avoid the contaminated area.
- Secure accident area until the hazard is eliminated. Close off job site if necessary.
- Coordinate and conduct additional safety training regarding potential hazards present on site.

## ***Emergency Services / First Aid (Optional)***

Prior to commencement of a project, emergency services (911) must be available. If emergency services are not available;

- A person who has a valid certification in First Aid Training from the U.S. Bureau of Mines, the American Red Cross, or equivalent training shall be at the worksites. The training will be verified by documentary evidence.
- The locations of First Aid Kits and emergency phone numbers (physicians, hospital and ambulances services) shall be clearly marked and employees shall be knowledgeable of the whereabouts.
- First Aid Kits shall be readily accessible and regularly inspected and consist of the following supplies at a minimum:
  - 25 - 3/4" x 3" Adhesive plastic bandages
  - 3 - 1 3/4" x 3" Large fingertip fabric bandages
  - 2 - 1 1/2" x 3" Knuckle fabric bandages
  - 1 - 36" x 36" x 51" Triangular sling/bandage, with 2 safety pins
  - 6 - 2" x 2" Gauze dressing pads
  - 1 - 2" x 4.1 yd. Conforming gauze roll bandage
  - 1 - 5" x 9" Trauma pad
  - 1 - Sterile eye pad
  - 12 - Antiseptic Cleansing Wipes (sting-free)
  - 6 - Triple antibiotic ointment packs
  - 3 - Insect sting relief pads
  - 1 - Eye wash, 4 oz.
  - 1 - 4" x 5" Instant cold compress
  - 1 - 1/2" x 5 yd. First aid tape roll
  - 1 - 4 1/2" Scissors, nickel plated
  - 1 - 4" Tweezers, plastic
  - 2 - Exam quality gloves, 1 Pair

If any injury required more than first aid, trained medical personnel shall provide transportation.

## ***Eye-Washing Station***

A 15-minute eye-flush station shall be available when working with corrosive chemicals or materials.

## ***Ammonia Safety***

### **Ammonia First Aid Procedures**

Ammonia is one of the most water-soluble of all gases. Accordingly, the best means of providing first aid for an injury caused by ammonia contact with the eyes or skin is to flush immediately the injury area with large quantities of clean water. Promptness in initiating treatment, using adequate quantities of water and continuous application for at least fifteen minutes, or longer if necessary, are all essential in successful first aid management of an eye or skin injury resulting from contact with ammonia. Cool coffee, tea and even a fruit flavored beverage are all reported as having been used with good effect in starting first aid treatment when water was not immediately available. A physician must be called promptly for any person who has been burned severely or overcome by ammonia. The physician should be given a complete account of the cause of injury. Speedy removal of the patient from the contaminated location is important to avoid aggravation of the injury.

*PRIOR TO MEDICAL AID BY THE PHYSICIAN, FIRST AID PROCEDURES SHOULD BE EMPLOYED. THOSE PRESENTED HEREIN ARE BASED UPON WHAT IS BELIEVED TO BE COMMON PRACTICE IN THE INDUSTRY. THEIR ADOPTION IN ANY SPECIFIC CASE SHOULD, OF COURSE, BE SUBJECT TO PRIOR ENDORSEMENT BY A COMPETENT MEDICAL ADVISOR.*

As a guide in case of injury caused by ammonia, the following first aid procedures are suggested:

***Inhalation*** – Any conscious person who has incurred irritation due to inhalation of ammonia and vapor should proceed at once to a location free of ammonia and breathe fresh air. If exposure has been minimal, usually no other treatment will be necessary.

A person overcome by ammonia must be carried to a location free of ammonia and the services of a physician obtained promptly. Successful resuscitation requires SPEED and EFFICIENCY. DELAY AND INEXPERIENCE MAY RESULT IN A FATALITY.

If there is an obstruction to the patient's breathing, the airway must be cleared by appropriate methods which may include proper positioning of the patient's head, pulling the tongue forward and clearing any blockage from the mouth such as dentures or vomitus. If spontaneous breathing does not resume after the airway has been cleared, artificial respiration should be started immediately by mouth-to-mouth resuscitation (expired-air ventilation, rescue breathing), preferably by an individual trained in the procedure.

Oxygen therapy may be indicated once the patient's breathing has been restored or if it continues to be labored. Such therapy should not replace immediate mouth-to-mouth resuscitation and should only be applied during a sustained resuscitation period or if the patient is to be moved.

**CAUTION:** It may not be advisable to administer oxygen under positive pressure if the patient is in shock or there is impending or existing cardiovascular failure. **Oxygen therapy equipment should be used only by qualified and experienced personnel.**

**Eyes** – If contacted by ammonia, the eyes must be flooded immediately with copious quantities of clean water. Speed is essential. If contact lenses are worn, they must be removed, otherwise ammonia may be trapped underneath causing a severe burn. In isolated areas, water in a squeeze bottle, which can be carried in the pocket, is helpful for emergency irrigation purposes. An eye fountain should be used, but if not available, clean water from any source may be poured over the eyes. In any case, the eyelids **MUST BE HELD OPEN** and irrigation continued for at least 15 minutes for an hour, each time irrigating for a period of 5 minutes until medical attention can be obtained. Such attention must be received promptly from a physician, preferably an ophthalmologist. No oils or any medication should be placed in the eyes unless ordered **BY A PHYSICIAN**. If prescribed **BY A PHYSICIAN**, 2 to 3 drops of topical anesthetic such as 1/2% tetracaine hydrochloride (Pontacaine) may be instilled to relieve pain and to permit more thorough flushing of the eyes with water.

**Skin And Mucosa** – If contacted by liquid ammonia, the body area affected should be immediately flooded with water. If no safety shower is available, utilize any available water source. Water will have the effect of thawing out clothing that may be frozen to the skin.

**Caution: DO NOT remove clothing until completely thawed or you may remove raw flesh causing further damage.** Such clothing should be removed and flooding of the skin with water continued for at least 15 minutes.

Do not apply salves or ointments to skin or mucous membrane burns during the 24-hour period following injury. Subsequent medical treatment is otherwise the same as for thermal burns.

**Internal** – Swallowing of liquid ammonia is very unlikely. However, if ammonia has been taken internally and if the patient is **CONSCIOUS** and able, have him drink large quantities of water immediately. **NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.** Should the patient vomit, place his face down with head lower than hips to prevent vomitus from entering lungs. Transport patient to a physician promptly and apply other first aid treatment as he or she may prescribe.

## **Emergency Measures**

Every plant, warehouse, office or other facility is susceptible to emergency situations that can result in property damage and/or bodily harm to employees, visitors or even neighbors. An entity using ammonia bears responsibility for the development and implementation of comprehensive and effective plans designed to meet these situations in a manner as will protect the safety of human life, physical assets and the environment to the greatest degree practicable within the constraints of governmental regulations and prudent business practice.

## APPENDIX A

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### EMERGENCY NUMBERS

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COMPANY NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

AMBULANCE **911** \_\_\_\_\_

HOSPITAL \_\_\_\_\_

DOCTOR \_\_\_\_\_

FIRE DEPARTMENT **911** \_\_\_\_\_

POLICE **911** \_\_\_\_\_

GAS COMPANY \_\_\_\_\_

POISON CONTROL CENTER \_\_\_\_\_

POLLUTION CONTROL \_\_\_\_\_

ELECTRIC COMPANY \_\_\_\_\_

WEATHER FORECAST \_\_\_\_\_

## APPENDIX B

### PERSONNEL LIST

Please type or print legibly

List in order they are to be called.

Title	Name	Home Telephone Number

## APPENDIX C

### FEDERAL OSHA 29 CFR PART 1904.8

- **Standard Number: 1904.8**
  - **Standard Title: Reporting of fatality or multiple hospitalization incidents**
    - (a) Within 8 hours after the death of any employee from a work-related incident or the in-patient hospitalization of three or more employees as a result of a work-related incident, the employer of any employees so affected shall orally report the fatality/multiple hospitalization by telephone or in person to the Area Office of the Occupational Safety and Health Administration (OSHA), U.S. Department of
    - (b) Labor, that is nearest to the site of the incident, or by using the OSHA toll-free central telephone number.
    - (c) This requirement applies to each such fatality or hospitalization of three or more employees which occurs within thirty (30) days of an incident.
    - (d) Exception: If the employer does not learn of a reportable incident at the time it occurs and the incident would otherwise be reported, under paragraphs (a) and (b) of this section, the employer shall make the report within 8 hours of the time the incident is reported to any agent or employee of the employer.
    - (e) Each report required by this section shall relate the following information: Establishment name, location of incident, time of the incident, number of fatalities or hospitalized employees, contact person, phone number, and a brief description of the incident.
- MNOSHA Chapter 182 5210.0680
- **Standard Number 5210.0680**
  - **Standard Title: Reporting of fatality or multiple hospitalization incidents**
    - Subpart 1. **When and where to report.** Within eight hours after the death of any employee from a work-related incident or the inpatient hospitalization of three or more employees as a result of a work-related incident, the employer of any employees so affected shall orally report the fatality or multiple hospitalization by telephone or in person to any Minnesota Department of Labor and Industry, Occupational Safety and Health Division (Minnesota OSHA) office. After normal business hours and on Saturdays, Sundays, and state holidays, the report shall be made within the eight-hour time period by using the federal Occupational Safety and Health Administration (federal OSHA). United States Department of Labor, toll free central telephone number (1-800-321-OSHA (6742)).
    - Subpart. 2. **Application.** The reporting requirement specified in subpart 1 also applies to an employment incident which is not immediately reportable but within 30 days of the occurrence of the incident subsequently results in a death or hospitalization of three or more employees.
    - Subpart. 3. **Exception.** If the employer does not learn of a reportable incident at the time it occurs and the incident would otherwise be reportable under subparts 1 and 2, the employer shall make the report within eight hours of the time the incident is reported to any agent or employee of the employer.
    - Subpart. 4. **Report contents.** Each report required by this part shall include the following information:
      - A. Establishment name;
      - B. Location of the incident;
      - C. Time of the incident;
      - D. Number of fatalities or hospitalized employees;
      - E. Name and telephone number of a contact person; and
      - F. A brief description of the incident



## **Personal Protective Equipment**

Certain personal protective equipment is required. Personal protective equipment is designed for a specific need and is mandatory for specific operations.

Generally, the company will provide the necessary Personal Protection Equipment. If the employee chooses to provide his or her own Personal Protection Equipment the following requirement must be met:

- They must inform his/her Supervisor or Foreman that they are using non-company issued Personal Protection Equipment.
- The Personal Protection Equipment must meet all ANSI requirements.
- The Personal Protection Equipment must be properly maintained.

### ***Eye Protection***

- ANSI approved Safety glasses/goggles are to be worn by all employees working in or having business in designated areas or if there is a chance of getting chemical liquids or a foreign object in your eye. This includes clean-up time.
- Operators of cutters and others in the close proximity of cutting operations shall wear safety glasses. This includes clean-up time.
- Adherence to eye protection standards will be included in inspections.
- In addition to safety glasses/ goggles, face shields will be required in specific jobs. Ask your Supervisor or Foreman, if you have any questions on your job.
- Welding, soldering and certain cutting operations require special eye protection.

### ***Hand Protection***

Hand protection is designed to prevent contact with skin and the substance being used. Be sure the gloves used are designed for the application that applies. Proper gloves are required when performing hot work or if specified in the product MSDS.

- Inspect gloves prior to use. If any tears, cuts or excessive wear is found, replace them prior to work.
- After use, clean gloves thoroughly. If using acids, caustics or solvents, inspect to ensure that material has not penetrated the glove.

### ***Body Protection***

Typically, full-length trousers and a shirt are sufficient body protection. If special body protection is needed for your job you will be notified by your Supervisor, Foreman or by the Safety Director.



## ***Head Protection***

In most cases, head protection (hard hat) is not required. Head protection is required when:

- There is a chance of being struck by flying or falling objects.
- When working within 10 feet of a power line carrying greater than 440vAC.
- If required by the building owner or contractor.

## ***Hearing Protection***

Hearing protection must be worn in areas identified as high noise areas. A high noise area is one that has noise levels above 85 decibels. If you need to raise your voice to speak to someone three feet away, you should be using hearing protection.

Ear plugs and muffs are rated for reduction of decibels. Plugs and muffs rated for 30 dBA are required for use on Gartner Refrigeration projects for high noise areas. Exposure to sound may change/vary based upon location and surrounding conditions.

The following is a list of activities that call for mandatory hearing protection:

- Grinding
- Working in an Engine Room that's in operation
- Operating power actuated tools
- Chop saws on metal
- Cutoff saw

The above list only includes a few examples and is *not* considered to be comprehensive.

When employees are subjected to sound levels exceeding those listed in the Table below, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce the noise levels within the levels of the table, personal protective equipment as required in Subpart E shall be provided and used to reduce sound levels within the levels of the table.

### Permissible Noise Exposures

During per day, hours	Sound level dBA slow response
8	40
6	92
4	95
3	97
2	100
1½	105
1	105
½	110
% or less	115

In all cases, where the sound levels exceed the values shown herein, a continuing effective hearing conservation program shall be administered 1926.52 (d)(1).

When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. Exposure to different levels for various periods of time shall be computed according to the formula set forth in paragraph (d)(2)(ii) of 1926.52.

When audiometric measurements are taken, accurate records will be maintained at the Gartner Refrigeration office. Other records such as exposure records and noise monitoring will also be kept at the Gartner Refrigeration office.

### ***Respiratory Protection***

If your work involves the wearing of a respiratory your foreman will inform you and a respirator will be issued. Respirator use without a medical evaluation and training is prohibited.

Only approved respiratory equipment shall be used.

### ***Training***

Personal Protection Equipment Training shall consist of the following;

- When Personal Protection Equipment is necessary.
- What Personal Protection Equipment is necessary.
- Proper care, maintenance and disposal of Personal Protection Equipment.

### ***Retraining***

Retraining is required when;

- The workplace changes, making previous training obsolete.
- The type of Personal Protection Equipment changes.
- When lack of use, improper use or insufficient skills and/or understanding is shown.

**DEFECTIVE OR DAMAGED PERSONAL  
PROTECTION EQUIPMENT MUST NOT BE USED**



# PERSONAL PROTECTIVE EQUIPMENT (PPE) REQUIREMENTS

JOB TASK	SAFETY SHOES	FACE SIELD	EYE PROTECTION	HEARING PROTECTION	HEAD PROTECTION	RESPIRATOR	WELDING HELMET	GLOVES	PROTECTIVE CLOTHING
WELDING									
GRINDING									
BAND SAW									
CHOP SAW									
PRESS BRAKE									
SLIP ROLL									
CUTTING									
SHEARING									

M = MANDATORY

N = NOT MANDATORY

A = AS NEEDED FOR SPECIFIC JOB CATEGORY

Location: \_\_\_\_\_

Date: \_\_\_\_\_

Evaluated by: \_\_\_\_\_



# PERSONAL PROTECTIVE EQUIPMENT (PPE) HAZARD ASSESSMENT

JOB TASK	FACE				EYE					WHOLE BODY				
	Struck-by	Heat	Chemical	Dust	Struck-by	Heat	Chemical	Dust	Light / Radiation	Chemical	Electric Shock	Heat	Flame / Fire	Dust / Fumes / Vapors
WELDING														
GRINDING														
BAND SAW														
CHOP SAW														
PRESS BRAKE														
SLIP ROLL														
CUTTING														
SHEARING														

Location: \_\_\_\_\_

Date: \_\_\_\_\_

Evaluated by: \_\_\_\_\_



# PERSONAL PROTECTIVE EQUIPMENT (PPE) HAZARD ASSESSMENT

	FOOT				HAND / ARM					HEAD		
JOB TASK	Struck-by	Compression	Punctures	Electrical	Cuts	Abrasions	Punctures	Burns	Temperature Extremes	Struck-by	Electric Shock	Impact with stationary object
WELDING												
GRINDING												
BAND SAW												
CHOP SAW												
PRESS BRAKE												
SLIP ROLL												
CUTTING												
SHEARING												

Location: \_\_\_\_\_

Date: \_\_\_\_\_

Evaluated by: \_\_\_\_\_



## Confined Space Program

The Minnesota Department of Labor & Industry OSHA Laws and Rules Chapter 182 Parts 5207.0300 – 5207.0304 defines a confined space as:

- An atmospheric condition in which a dangerous air contamination, oxygen deficiency or oxygen enrichment may exist or develop;
- A condition where the emergency removal of a suddenly disabled person is difficult due to the location or size of the opening; or
- A condition where the risk of engulfment exists or could develop.

Some examples of confined spaces are storage tanks, process vessels, bins, boilers, ventilation or exhaust ducts, sewers, underground utility vaults, tunnels, and pipelines. Open-top spaces more than four feet in depth such as pits, tubs, vaults, and vessels are also classified as confined space.

Because of the unique dangers associated with working in confined spaces, the Project Manager and Superintendent should review work of this type before starting a project. Using a pre-entry checklist can identify dangers associated with various types of spaces.

An annual review of this program will be conducted with revised as necessary to protect employees from confined space hazards.

### Definitions

Atmospheric Testing: The testing of the atmosphere of all confined spaces by a qualified person before entry. Records will be kept each day or shift and filed at the jobsite until completion of the work.

Attendant: A person posted at the entrance to any Class II or III occupied confined space that monitors the activities of the person inside the confined space.

- This attendant is not a rescue person. Under no circumstance should the standby person enter the confined space without informing the rescue team.

Authorized Entrant: The person who is authorized to enter and work in the confined space. This person's name must be on the entry (work) permit.

Confined Space Entry: Any action, which results in or requires any part of the worker's body to break the plane of any opening of the confined space. Confined space entry also includes any ensuing work activities within the confined space.

Dangerous Air Contamination: An atmosphere, which presents a threat of acute injury, illness, disablement or death due to the presence of toxic, flammable, explosive or otherwise injurious or incapacitating substances.

Engulfment: The surrounding of a worker by particulate matter, liquid or gas in a confined space.

Entry (Work) Permit: A documentation form that has to be completed before entry into a confined space is permitted. The permit should be posted at the entrance to the space for the duration of the work (Class I) or shift (Class II & III). When work in the confined space is completed, a copy of the permit should be kept in the jobsite file.

Entry Supervisor: The person who supervises work within the confined space.

Host Company: A company that arranges to have employees of another company perform work.

**Immediately Dangerous to Life & Health (IDLH):** The maximum concentration of a substance from which a worker could escape from the confined space within 30 minutes without experiencing any impairing symptoms or adverse, irreversible health effects.

**Labeling and Posting:** The entry to the confined space must be labeled with a sign. Such sign should read “Danger - Confined Space - Entry by Permit Only”.

**Oxygen Deficiency:** An atmosphere containing less than 19.5 percent oxygen by volume.

**Oxygen Enrichment:** An atmosphere containing greater than 23.5 percent oxygen by volume.

## ***Confined Space Entry Identification***

A confined space has the following characteristics.

- Contains or has a potential to contain a safety hazard or hazardous atmosphere
- Contains or has a potential to contain a material that has the potential for engulfing an entrant;
- Is not meant for continuous work or occupancy;
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
- Any other recognized serious safety or health hazard.

## ***Types of Confined Spaces***

Confined spaces falls under two regulatory categories --- Construction (Minnesota Department of Labor & Industry OSHA Laws and Rules Chapter 182 Parts 5207.0300 – 5207.0304) and General Industrial (CFR 1910.146).

### **Construction**

When working on new constructions or installing new equipment Minnesota Department of Labor & Industry OSHA Laws and Rules Chapter 182 Parts 5207.0300 – 5207.0304 will apply. These rules divide confined spaces into the following categories:

**Class I Confined Spaces** are confined spaces where an atmosphere with dangerous air contamination, oxygen deficiency, or oxygen enrichment is unlikely to develop and are divided into two categories --- Class IA and Class IB.

**Class IA** confined spaces are spaces where no risk of engulfment can exist, and where the atmosphere cannot develop a dangerous air contaminant or oxygen enrichment and all known hazardous sources are positively controlled.

**Class IB** confined spaces are spaces that are unlikely to develop a dangerous air contaminant, oxygen deficiency, or oxygen enrichment and have no potential for an engulfment condition.

Entry permits may be issued for the duration of the job and no standby person is needed if the following requirements are met:

- Specific entry procedures are established and listed on the Confined Space Entry Permit.
- Workers are trained in confined space practices and procedures.
- The atmosphere is tested before each entry.
- That continuous air monitoring and/or ventilation is performed.

**Class II Confined Spaces** are confined spaces where an atmosphere free of dangerous air contamination, oxygen deficiency or oxygen enrichment has been verified.

When entering a Class II confined space, an entry permit must be completed and posted at the entrance of the confined space. A standby person must assist the person or persons within the confined space and must have visual, voice or signal line communication with each individual in the confined space.

**Class III Confined Spaces** are confined spaces where an atmosphere free of dangerous air contamination, oxygen deficiency or enrichment cannot be verified.

When entering a Class III confined space, an entry permit must be completed and posted at the entrance of the confined space. A standby person must assist the person or persons within the confined space and must have visual, voice or signal line communication with each individual in the confined space.

Rescue equipment must be readily available and proper personal protection equipment needs to be worn. When respirators are used, a person trained in CPR shall be immediately available.

### ***General Industry***

CFR 1910.146 rules will apply when routine maintenance is performed, when repairs to existing systems are made, replacing equipment or parts or when working in a Host Company designated confined space. Before working in a Host Company confined space the following should be completed:

- Obtain any available information regarding permit space hazards and entry operations.
- Coordinate, develop and implement entry and rescue procedures with the host company.
- Inform the Host Company of any confined space hazards that might be generated during work activities.
- If no Host Company Program is available, entry will be treated as a Class II or Class III entry depending upon the conditions.

### ***Rescue Team***

If the Host Company or contractor does not provide a rescue team, the rescue team shall consist of offsite personnel, usually the local fire department. The entry supervisor will contact the Host Company rescue team or off site personnel; and notify them that a confined space entry is going to be made.

### ***Entry (Work) Permit System***

An entry (work) permit is required for all employees requiring access into any area defined as a confined space. The work permit will authorize specified employees to access the confined space indicated on the work permit so long as all conditions are met.

In situations where the permit conditions are not met, where the work conditions have changed or when requested by the Authorized Entrant or Attendant, the work permit shall be revoked and reviewed ---- prohibiting any further work activities within the confined space.





The review is not finished until the entry permit is signed and the reviewing person feels the employees are competent.

## ***Operating Procedures***

The entry supervisor should develop a plan for any work that will be done in the confined spaces. The plan should cover:

- Each of the items on the work permit
- Methods for maintaining communication with the workers from outside the confined space,
- Methods for rescue and contacting emergency assistance in an emergency,
- Standby person duties and responsibilities,
- Procedures for completing the work and
- Air monitoring of the confined space.

## ***Training***

Any employee who is exposed to a confined space shall receive training by a competent person. Training should address confined space hazards as well as outline safe working procedures. All employees who will be working in a confined space shall receive training upon first entering a confined space and annually thereafter. Training will include:

### **Attendant**

- Know hazards that may be faced during entry.
- Know possible behavioral effects of the hazards.
- Continuously maintain accurate count of entrants.
- Remain outside space during entry operations until relieved.
- Communicate with entrants to monitor their status and alert them of need to evacuate.
- Monitor activities inside and outside of space.
- Summon rescue and emergency services when necessary.
- Warn unauthorized persons to stay away.
- Perform non-entry rescues per employer's procedure.
- Perform no duties that interfere with your primary duty to monitor entrants.

### **Authorized Entrant**

- Know the hazards you may face during entry, including symptoms, signs, and consequences of exposure.
- Properly use all required personal protective equipment.
- Communicate with the attendant as necessary to enable the attendant to monitor your status and alert entrants of any need to evacuate.
- Alert the attendant whenever you detect any warning sign or symptom of exposure to a dangerous situation or a prohibited condition.
- Exit from the space as quickly as possible when the attendant tells you to do so, when you recognize any warning sign, when you detect a prohibited condition, or when you hear the evacuation alarm

### **Entry Supervisor**

- Know hazards that may be faced during entry.
- Verify that acceptable conditions for entry exist.
- Terminate entry when prohibited condition arises.
- Verify that rescue services are available.

- Remove unauthorized persons who enter or attempt to enter during the entry operations.
- Determine that acceptable entry conditions are maintained.
- Coordinate with others trades that be working in the confined space.

### ***Certification***

All documentation shall bear the names of the employees trained, the date of the training and the name, signature and title of the person who conducted the training.

All documentation is maintained in the main office.

## Confined Space Pre-Entry Checklist

Forward a completed copy of this form to the Safety Director.

Use this checklist to evaluate the confined space. If question is not applicable, write N/A.

Do not enter a confined space until you have considered every question, and have determined the space to be safe.

Yes                  No  
\_\_\_\_                  \_\_\_\_

Is entry necessary?

### Possible Hazards

\_\_\_\_\_  
\_\_\_\_\_

List possible hazards within the confined space: i.e. atmospheric hazards (oxygen, flammables, toxics) mechanical hazards, piping and valves, temperatures, etc.

Yes                  No  
\_\_\_\_                  \_\_\_\_  
\_\_\_\_                  \_\_\_\_

### Testing

Are the instruments used in atmospheric testing properly calibrated?

Has the person doing the atmospheric testing been trained in the proper usage of the testing equipment?

Yes                  No  
\_\_\_\_                  \_\_\_\_  
\_\_\_\_                  \_\_\_\_  
\_\_\_\_                  \_\_\_\_

### Monitoring

Will the atmosphere in the space be monitored while work is going on?  
Continually?

Periodically? (If yes, give interval: \_\_\_\_\_)

Yes                  No  
\_\_\_\_                  \_\_\_\_  
\_\_\_\_                  \_\_\_\_  
\_\_\_\_                  \_\_\_\_

### Cleaning

Has the space been cleaned before entry is made?

Was the space steamed?

If so, was it allowed to cool?

Yes                  No  
\_\_\_\_                  \_\_\_\_  
\_\_\_\_                  \_\_\_\_  
\_\_\_\_                  \_\_\_\_  
\_\_\_\_                  \_\_\_\_

### Ventilation

Has the space been ventilated before entry?

Will ventilation be continued during entry?

Is the air intake for the ventilation system located in an area that is free of combustible dusts, vapors and toxic substances?

If atmosphere was found unacceptable and then ventilated, was it re-tested before entry?

Yes                  No  
\_\_\_\_                  \_\_\_\_  
\_\_\_\_                  \_\_\_\_  
\_\_\_\_                  \_\_\_\_  
\_\_\_\_                  \_\_\_\_  
\_\_\_\_                  \_\_\_\_

### Isolation (Lock-Out/Tagout)

Has the space been isolated from other systems?

Has electrical equipment been locked out?

Have disconnects been used where possible?

Has mechanical equipment been blocked, chocked, and disengaged where necessary?

Have lines under pressure been blanked and bled?

## Confined Space Pre-Entry Checklist ..... Cont

Yes	No	<u>Clothing/Equipment</u>
_____	_____	Is special clothing required (boots, chemical suits, glasses, etc.)?
_____	_____	If so specify: _____.
_____	_____	Is special equipment required (rescue equipment, communications equipment, etc.)? If so specify: _____.
_____	_____	Are special tools required (spark proof)?
_____	_____	If so specify _____
Yes	No	<u>Respiratory Protection</u>
_____	_____	Is respiratory protection required (air-purifying, supplied air, self-contained breathing apparatus, etc.)? If so, specify type:
_____	_____	_____
_____	_____	(Coordinate with Safety Director.)
_____	_____	Are MSHA/NIOSH - approved respirators available?
_____	_____	(Coordinate with Safety Director.)
Yes	No	<u>Training</u>
_____	_____	Have entrants been trained in proper use of a respirator?
_____	_____	Are entrants medically capable of wearing a respirator?
_____	_____	Is supervision and rescue team certified in first aid/CPR?
_____	_____	Have entrants been trained in confined space entry and do they know what hazards to look for?
Yes	No	<u>Attendants</u>
<input type="checkbox"/>	<input type="checkbox"/>	Will there be an attendant on the outside in constant visual or auditory communication with the person on the inside?
<input type="checkbox"/>	<input type="checkbox"/>	Will the attendant be able to see and/or hear the person inside at all times?
<input type="checkbox"/>	<input type="checkbox"/>	Will safety lines and harness be required to remove a person?
<input type="checkbox"/>	<input type="checkbox"/>	Are company rescue procedures available to be followed in the event of an emergency?
<input type="checkbox"/>	<input type="checkbox"/>	Is the attendant familiar with emergency rescue procedures?
<input type="checkbox"/>	<input type="checkbox"/>	Does the attendant know who to notify and how in the event of an emergency?
Yes	No	<u>Permit</u> (The permit is an authorization in writing that states that the space has been tested by a qualified person, that the space is safe for entry; what precautions, equipment, etc. are required; and what work is to be done.)
<input type="checkbox"/>	<input type="checkbox"/>	Has a confined space entry permit been issued?

\_\_\_\_\_  
Person completing checklist

\_\_\_\_\_  
Person issuing permit

\_\_\_\_\_  
Date

## CONFINED SPACE WORK PERMIT

Type of Permit: ☐ Class I (Expiration Date: \_\_\_\_\_) ☐ Class II ☐ Class III  
 \*\* Class II & III Permit valid for one shift or maximum of 12 hours

JOB # \_\_\_\_\_ SUPERINTENDENT \_\_\_\_\_  
 CITY \_\_\_\_\_ PERSON-IN-CHARGE \_\_\_\_\_  
 WORK AREA \_\_\_\_\_ DATE \_\_\_\_\_  
 PERSON PERFORMING ATMOSPHERIC TEST \_\_\_\_\_

### *Permit Required*

### *Non-Permit Required*

1. Atmospheric Testing				
Type of testing instrument: _____	Reading	Reading	Reading	Reading
Time _____				
Oxygen _____	_____	_____	_____	_____
Flammable _____	_____	_____	_____	_____
Toxic H <sub>2</sub> S and CO _____	_____	_____	_____	_____
Other (_____) _____	_____	_____	_____	_____

2. Descriptions of Hazards: _____	Yes	No		Yes	No
3. Continuous Monitoring ( ) ( )			9. Safety Equipment and Clothing		
If not continuously monitored, periodic tests are needed.			Head Protection ( ) ( )		
Document readings in the above table.			Hearing Protection ( ) ( )		
4. Respirator Use ( ) ( )			Hand Protection ( ) ( )		
5. Training of Personnel ( ) ( )			Foot Protection ( ) ( )		
6. Labeling and Posting ( ) ( )			Body Protection ( ) ( )		
7. Preparation:			Respiratory Protection ( ) ( )		
Isolate/Lockout/Tag ( ) ( )			Ground Fault Protection ( ) ( )		
Purge and Ventilate ( ) ( )			Low Voltage ( ) ( )		
Special			10. Rescue Equipment ( ) ( )		
Equipment & Tools ( ) ( )			SCBA's ( ) ( )		
8. Procedures:			Tri-Pod/Hoisting Device ( ) ( )		
Initial Work Plan ( ) ( )			Body Harness ( ) ( )		
Communications ( ) ( )			11. Recordkeeping/Exposure ( ) ( )		
Rescue ( ) ( )			12. Attendant Required at Entry ( ) ( )		

I have received instruction on this work and fully understand and have complied with all provisions noted on this form and will follow all confined space safety procedures.

ENTRY SUPERVISOR \_\_\_\_\_  
 Employees \_\_\_\_\_

## MNOSHA CONFINED SPACE CLASSIFICATION TABLE FOR CONSTRUCTION

PARAMETERS	CLASS I	CLASS II	CLASS III
<b>Characteristics</b>	Confined space where an atmosphere with dangerous air contamination, oxygen deficiency, or oxygen enrichment is unlikely to develop.	Confined spaces where an atmosphere free of dangerous air contamination, oxygen deficiency or oxygen enrichment has been verified.	Confined space where an atmosphere free of dangerous air contamination, oxygen deficiency or enrichment cannot be verified.
<b>Oxygen</b>	19% to 21.4%	19% to 21.4%	19.4% or less
<b>Flammability Characteristics</b>	10% LEL or less	10% LEL or less	10% or greater of LEL
<b>Entry Requirements</b>	<ol style="list-style-type: none"> <li>1. Annual Permit Required</li> <li>2. <b>Space tested for oxygen &amp; air contaminates before each entry</b></li> <li>3. <b>Continuously and effective ventilated or continuous monitoring is performed</b></li> <li>4. <b>Personal Protective Equipment</b></li> <li>5. <b>No standby required</b></li> <li>6. <b>Safety belt or harness (optional)</b></li> <li>7. Hoisting devices (optional)</li> </ol>	<ol style="list-style-type: none"> <li>1. Permit required for each entry</li> <li>2. Safety belt or harness</li> <li>3. Hoisting devices</li> <li>4. Standby required</li> <li>5. Personal Protective Equipment</li> <li>6. Standard rescue procedures</li> </ol> <p>*Maintain communication *Alert rescue team before entering</p>	<ol style="list-style-type: none"> <li>1. Permit required for each entry</li> <li>2. Approved respirators shall be provided &amp; worn, other PPE</li> <li>3. Safety belt or harness</li> <li>4. Hoisting devices</li> <li>5. Standby required</li> <li>6. Standard rescue procedures</li> </ol> <p>*Maintain communication *Respirator &amp; SCBA available *Alert rescue team before entering * Personal trainer in CPR Available</p>
<b>Entry Preparation</b>	<ol style="list-style-type: none"> <li>1. The area must be checked for and isolated from any system or processes that might present a hazard.</li> <li>2. All electrical and mechanical systems associated with the space must be locked and tagged.</li> <li>3. The area must be purged and ventilated to reduce the amount of toxic materials or increase oxygen content as required.</li> <li>4. Work processes must be reviewed before starting to ensure they are the least hazardous methods available.</li> <li>5. Special tools and equipments need to be identified before the work begins.</li> <li>6. The Entry supervisor shall review confined space entry permit and work procedures with employees who will be working in that confined space. The Entry supervisor and all employees working in the confined space will sign the entry permit.</li> </ol>		

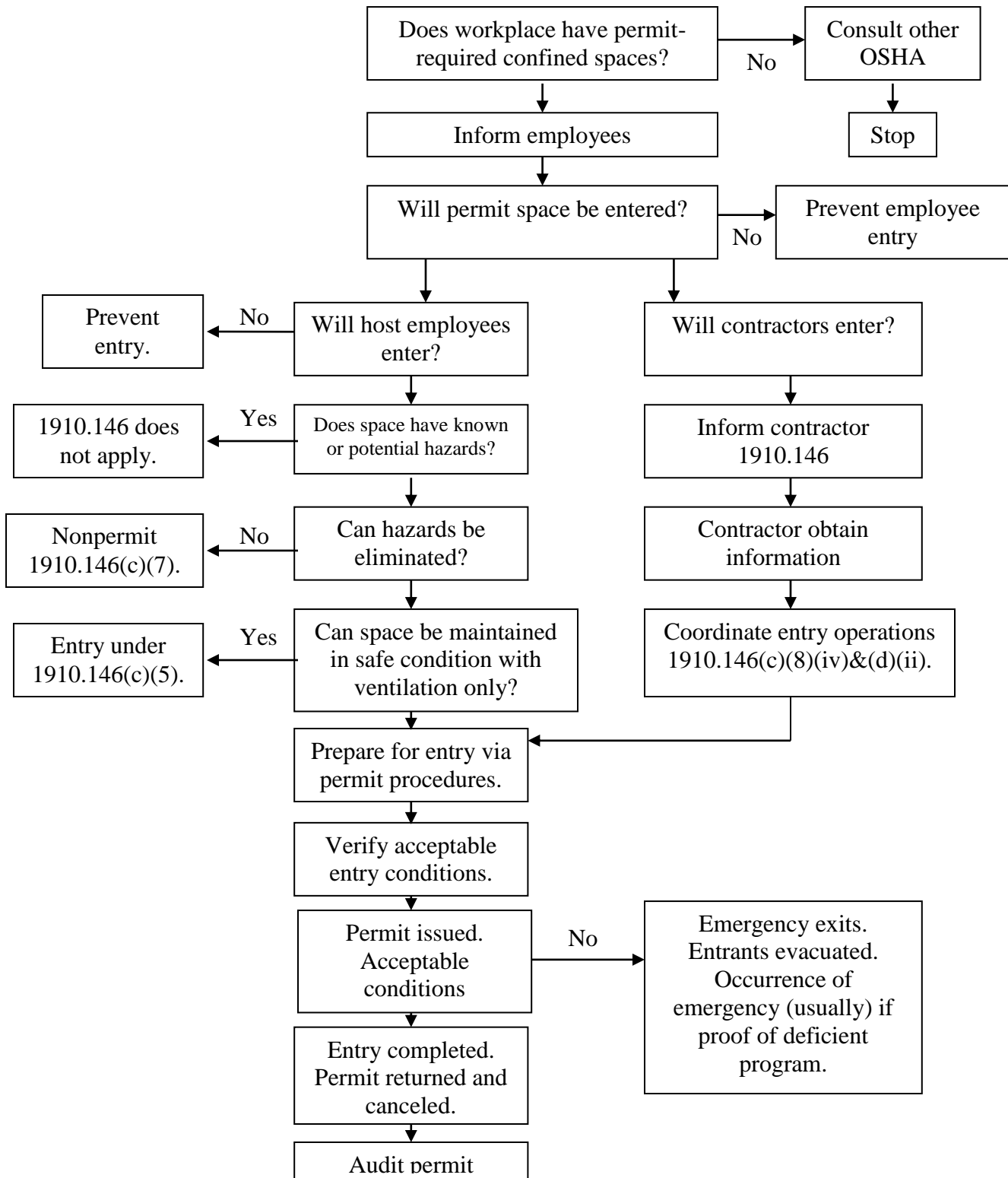
Note: Safety Director should be notified for confined spaces with possible toxic atmospheres other than Hydrogen Sulfide, Carbon Monoxide, or Chlorine

# **FERERAL OSHA CONFINED SPACE CLASSIFICATION TABLE**

PARAMETERS	PERMIT REQUIRED CONFINED SPACE	NON-PERMIT CONFINED SPACE
<b>Characteristics</b>	<p>Atmosphere that has one or more of the following characteristics:</p> <ol style="list-style-type: none"> <li>1) Confined space contains or has a potential to contain a hazardous atmosphere;</li> <li>2) Contains a material that has the potential for engulfing an entrant;</li> <li>3) Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly covering walls or by a floor which slopes downward and tapers to a smaller cross-section;</li> </ol> <p>or</p> <p>Contains any other recognized serious safety or health hazard.</p>	<p>Atmosphere where dangerous air contamination, oxygen deficiency or oxygen enrichment cannot develop or have the potential to contain any hazard capable of causing death or serious physical harm.</p>
<b>Oxygen</b>	19.4% or less or 23.6% or more	19.5% to 23.5%
<b>Flammability Characteristics</b>	Greater than 10% LEL	10% LEL or Less
<b>Toxicity</b>	<p>Hydrogen Sulfide 1ppm to 10ppm  Carbon Monoxide 1ppm to 35 ppm  Hydrogen Sulfide greater than 15 ppm is IDLH  Carbon Monoxide greater than 200 ppm is IDLH</p>	<p>Hydrogen Sulfide 0 ppm  Carbon Monoxide 0 ppm</p>
<b>Procedures</b>	<ol style="list-style-type: none"> <li>1) Contact Safety Department</li> <li>2) Permit required</li> <li>3) Personal protective equipment</li> <li>4) Attendant require <ul style="list-style-type: none"> <li>*Maintain communication</li> <li>*Alert rescue team</li> </ul> </li> <li>5) Rescue equipment <ul style="list-style-type: none"> <li>*Hoisting device</li> <li>*SCBA's available</li> </ul> </li> </ol> <p>Rescue team trained in CPR/First Aid</p>	<ol style="list-style-type: none"> <li>1) Space tested for oxygen and air contaminates</li> <li>2) Recommend to monitor and/or ventilate continuously</li> <li>3) No attendant required</li> <li>4) Standard rescue procedures</li> </ol>

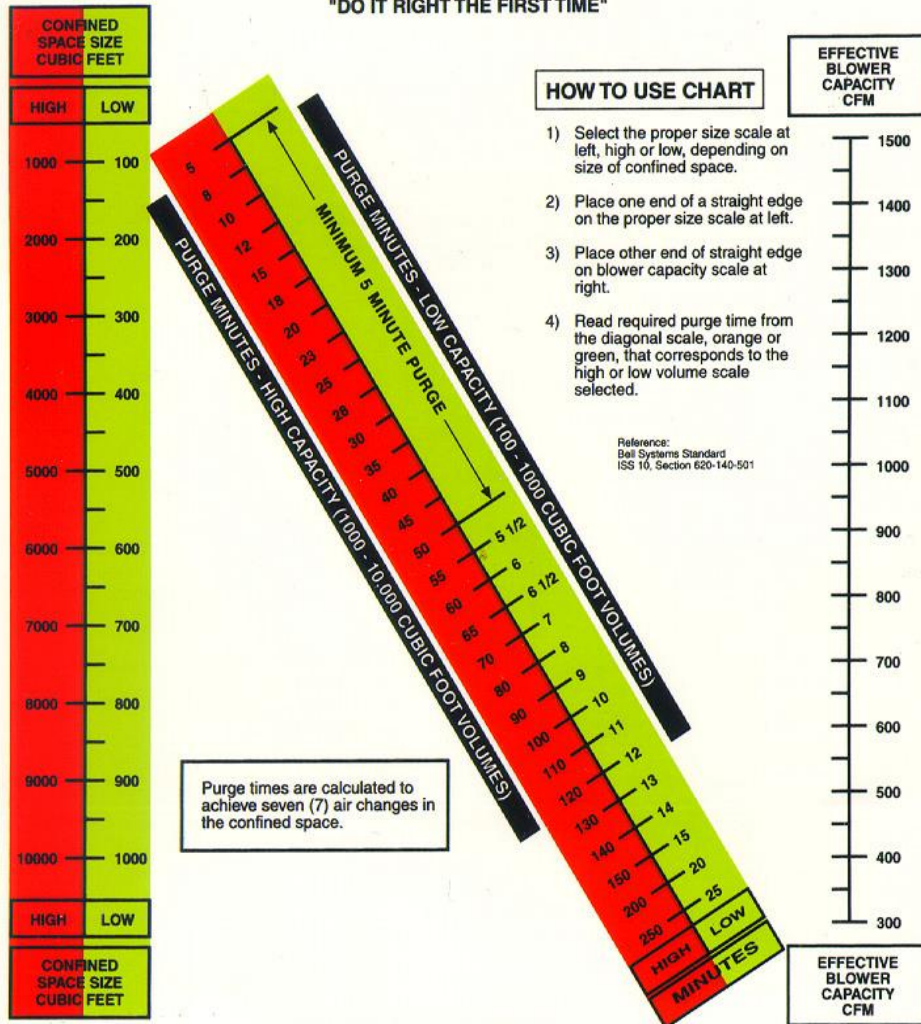


## CONFINED SPACE DECISION FLOW CHART



## ESTIMATING APPROXIMATE PURGE TIMES

### CONFINED SPACE ENTRY "DO IT RIGHT THE FIRST TIME"



### SPECIAL NOTES

- 1) Air quality of the confined space should be tested prior to ventilation.
- 2) Ventilate confined space for the minimum times as determined in the above chart and then retest air quality.
- 3) If toxic (combustible) gases or low oxygen is encountered, increase purge times by 50%.
- 4) If 2 blowers are used, add the two capacities, then proceed with the "How to use chart" above.
- 5) Effective blower capacity is measured with one or two 90° bends in 8" diameter 25 ft. blower hose.



## **Respirator Protection Program**

### ***Respirator Protection***

Gartner Refrigeration & Mfg., Inc. (GRC) has determined that employees in Ammonia Refrigeration Service, and Construction are exposed to respiratory hazards during routine operations. These hazards include ammonia vapors, and in some cases represent Immediate Dangerous to Life or Health (IDLH) conditions. The purpose of this program is to ensure that all Gartner Refrigeration employees are protected from exposure to these respiratory hazards.

In occasional ammonia leak situations, respirators, and other protective equipment must be used. Respirators are also needed to protect employees' health during emergencies. The work processes requiring respirator use at (GRC) are outlined in Table 1 in the Scope and Application section of this program.

### ***Scope and Application***

This program applies to all employees who are required to wear respirators during ammonia service work operations, and during some non-routine or emergency operations such as a spill of an ammonia substance. This includes employees servicing customer's equipment in their facility.

In addition, any employee who wears a respirator when a respirator is subject to the medical evaluation, cleaning, maintenance, and storage elements of this program, and must be provided with certain information specified in this section of the program.

Employees participating in the respirator protection program do so at no cost to them. The expense associated with training, medical evaluations and respiratory protection equipment will be borne by GRC.

The following PPM can be determined using the MSA "Kwick-Draw" pump.

<b>TABLE 1: VOLUNTARY AND REQUIRED RESPIRATOR USE AT GRC</b>	
Personal Protective Equipment	
Respirator	MSA Test PPM
MSA Gas Mask	25-400 PPM
SCBA w/ Splash Suit and Gloves	400-1000 PPM Only with a certified assistant.
SCBA w/Level A Suite	Call Fire Department for assistance 1000 PPM and above
Leave Area Immediately	1000 PPM and above

## ***Ammonia Safety Guidelines***

**Take hermetic tube/pump samples through cracked open door before entering spill area.**

1%	=	10,000 ppm
4%	=	40,000 ppm Safe lower Level of Explosive Limits
35 ppm	=	P.E.L. (Personal Exposure Level) Irritation max ppm for 8-hour working conditions
25-300 ppm	=	Gas Mask Required
300-500 ppm & above	=	SCBA use recommended (gas masks may not be adequate for all personnel)
Above 500 ppm	=	SCBA Required I.D.L.H. – Immediate Danger to Life & Health
Above 1,000 ppm	=	Level "A" Protection required by OSHA (Need back up team with Level "A" suit per OSHA) Max worker body temperature (in ear) 100°F.

### **NOTE:**

- A. Gartner Service Personnel are **NOT** Level 'A' Responders on their **OWN**. You need back up help using FIRE DEPARTMENT or HAZMAT Team.
- B. Work with FIRE DEPARTMENT and/or "HAZMAT" team to assist them.
- C. Level 'A' Response can only be performed on customers who have a PSM\* Process Safety Management Team

### **40,000 ppm and above**

**LEAVE AREA IMMEDIATELY – LOWER LEVEL OF EXPLOSIVE LIMIT.**

**NOTE: Often indicated by a dense cloud filling the room to near zero visibility.**

### **MSA KWICK DRAW PUMP**

Note: 3 different tubes

1. MSA Tube #804405 = 2 PPM – 500 PPM
  - a. 10-600 ppm Scale N=2 – Only 2 Strokes of MSA "Kwick Draw" pump
  - b. If reading is less than 50 ppm; take 8 more strokes (total 10) and read Scale N=10.
2. MSA Tube #800300 = 20 PPM – 1000 PPM 1 stroke = 20 PPM
3. MSA Tube #804400 = 10,000 (1%) – 100,000 PPM (10%)  
1 stroke = 10,000 PPM 10 strokes = 100,000 PPM

## ***Responsibilities***

Each individual must determine whether or not to wear a respirator or/SCBA by first sampling the NH<sub>3</sub> leak with a MSA “Kwick Draw” pump.

- Conducting qualitative fit testing with the safety equipment supplier
- Administering the medical surveillance program.
- Maintaining records required by the program.
- Evaluating the program
- Updating written program as needed.

## ***Program Administrator***

The Program Administrator is responsible for administering the respirator protection program. Duties of the program administrator include:

- Identifying work areas, processes that require workers to wear respirators, and evaluating hazards.
- Selection of respirator protection options.
- Monitoring respirator use to ensure that respirators are used in accordance with their certifications.
- Arranging for and/or conducting training.
- Ensuring proper storage and maintenance of respiratory protection equipment.
- Conducting qualitative fit testing.
- Administering the medical surveillance program.
- Maintaining records required by the program.
- Evaluating the program.
- Updating written program, as needed.

## ***Supervisors***

Supervisors are responsible for ensuring that the respiratory protection program is implemented in their particular areas. In addition to being knowledgeable about the program requirements and followed by the employees under their charge. Duties of the supervisor include:

- Ensuring that employees under their supervision (including new hires) have received appropriate training, fit testing, and annual medical evaluation.
- Ensuring the availability of appropriate respirators and accessories.
- Being aware of tasks requiring the use of respiratory protection.
- Enforcing the proper use of respiratory protection when necessary.
- Ensuring that respirators are properly cleaned, maintained, and stored according to the respiratory protection plan.
- Ensuring that respirators fit well and do not cause discomfort.

- Continually monitoring work areas and operation to identify respiratory hazards.
- Coordinating with the Program Administrator on how to address respiratory hazards or other concerns regarding the program.

### Employees

Each employee has the responsibility to wear his or her respirator when and where required and in the manner in which they were trained. Employees must also:

- Care for and maintain their respirators as instructed, and store them in a clean sanitary location.
- Inform their supervisor if the respirator no longer fits well, and request a new one that fits properly.
- Inform their supervisor or the Program Administrator of any respiratory hazards that they are not adequately addressed in the workplace and of any other concerns that they have regarding the program.

All examinations and questionnaires are to remain confidential between the employee and the physician.

### **Medical**

Employees who are either required to wear respirators, or who choose to wear an APR voluntarily, must pass a medical exam before being permitted to wear a respirator on the job. Employees are not permitted to wear respirators until a physician has determined that they are medically able to do so. Any employee refusing the medical evaluation will not be allowed to work in an area requiring respirator use.

A licensed physician at our designated medical clinic, where all company medical services are provided, will provide the medical evaluation. Medical evaluation procedures are as follows:

- The medical evaluation will be conducted using the questionnaire provided by the health care clinic and/or the respiratory protection standard. The Program Administrator will provide a copy of this questionnaire to all employees requiring medical evaluations.
- To the extent feasible, the company will assist employees who are unable to read the questionnaire (by providing help in reading the questionnaire). When this is not possible, the employee will be sent directly to the physician for medical evaluation.
- All affected employees will be given a copy of the medical questionnaire to fill out, along with a stamped and addressed envelope for mailing the questionnaire to the company physician. Employees will be permitted to fill out the questionnaire on company time.
- Follow up medical exams will be granted to employees as required by the standard, and/or deemed necessary by the medical clinic physician.

- All employees will be granted the opportunity to speak with the physician about their medical evaluation, if they so request.

The Program Administrator has provided the medical clinic physician with a copy of this program, a copy of the Respiratory Protection standard, the list of hazardous (ammonia) substances by work area, and for each employee requiring evaluation: his or her work area or job title, proposed respirator type and weight, length of time required to wear respirator, expected physical work load (moderate, heavy), potential temperature and humidity extremes, and any additional protective clothing required.

After an employee has received clearance and begun to wear his or her respirator, additional medical evaluations will be provided under the following circumstances:

- Employee reports signs and/or symptoms related to their ability to use a respirator, such as shortness of breath, dizziness, chest pains, or wheezing.
- The medical clinic physician or supervisor informs the Program Administrator that the employee needs to be reevaluated.
- Information from this program, including observations made during fit testing and program evaluation, indicates a need for reevaluation.
- A change occurs in workplace conditions that may result in an increased physiological burden on the employee.

### ***Fit Testing***

Fit testing is required for employees wearing MSA Gas Masks on SCBA's. Employees who are occasionally required to wear gas masks/SCBA's will be fit tested:

- Prior to being allowed to wear any respirator/SCBA.
- Annually.
- When there are changes in the employee's physical condition that could affect respiratory fit (e.g., obvious change in body weight, facial scarring, etc.)

Employees will be fit tested with the make, model, and size of respirator that they will actually wear. Employees will be provided with several models and sizes of respirators so that they may find an optimal fit. Fit testing of respirators is to be conducted in the negative pressure mode.

### ***Selection Procedure***

Approved Respirator Use - OSHA has set up standards for the use of respirators in IDLH and non-IDLH atmospheres:

Approved respirators for IDLH atmospheres:

Full face piece, pressure demand, self-contained breathing apparatus (SCBA) – not less than 30 minute tanks,

-or-

Combination full-face piece pressure demand supplied-air respirator (SAR) with auxiliary self-contained air supply.

Exception for areas with only oxygen deficiency: if an employer can demonstrate that, under all foreseeable conditions, oxygen levels in the work area can be maintained within OSHA defined safe ranges, then any atmosphere supplying respirator may be used. This is usually airline (SAR) without the escape bottle.

Approved respirators for non-IDLH atmospheres - for protection against gases and vapors:

An atmosphere supplying respirator (SCBA or SAR)

-or-

An air purifying respirator, provided that respirator is equipped with an end-of-life indicator (ESLI)

-or-

if there is no ESLI, the employer implements a change schedule for canisters and cartridges based on the workplace usage.

For protection against particulates –

An atmosphere supplying respirator (SCBA or SAR)

-or-

An air-purifying respirator equipped with high efficiency particulate (HEPA) filters,

-or-

An air-purifying respirator equipped with any particulate filter as long as it is certified for the condition(s) it is being used at the workplace (N,R,P).

## ***Respirator Use***

The SCBA's:

SCBA's are positive pressure or pressure demand respirators. There is nothing electrical on the system. The system is alarmed for safety. The alarm is designed to signal the wearer that



he is nearing tank exhaustion, with about 25% the air remaining. When this alarm sound the wearer should immediately exit the contaminated area. All alarms are mechanical. Some companies use bells, some whistles, and some other sounds.

This tank is under high pressure and the wearer cannot breathe directly from it. To reduce this pressure to something that the lungs can tolerate a regulator is employed. This regulator reduces the pressure to slightly higher pressure than the air that we normally breathe making the face piece positive pressure.

Provisions are made to insure, that in the event of regulator failure, the wearer can bypass the regulator and get air directly from the main tank. If the bypass is manual, cracking it slightly will get adequate air to allow the wearer to reach fresh air prior to air exhaustion. If the bypass is automatic, it will automatically switch to a secondary regulator in the event of primary regulator failure. If this occurs, the alarm will sound alerting the wearer that a problem exists.

A gauge on the tank always indicates the pressure remaining in the tank. OSHA requires that all tanks be maintained in a fully charged state and must be recharged for use when then gauge shows less than 90% pressure level.

OSHA requires that all self-contained breathing apparatus must be inspected monthly.

### ***Breathing Air***

Breathing air in SCBA's is composed of 21% oxygen and 78% nitrogen. It can be obtained from commercial sources and sometimes from local fire departments.

The requirements for air purity are specified by the Compressed Gas Association as Class D breathing air. This standard also specifies the amounts of allowable impurities – OSHA mandates this standard be used.

While on the subject of breathing air, it should be pointed out that the air in a tank can become stale. The exact time for this to occur depends on many factors including temperature and type of tank materials. It has been suggested that the air in these tanks be used or emptied every three-four months. This can easily be accomplished by scheduling training sessions and using the air. An easy way to keep up with the filing dates is to affix a piece of masking tape to the bottle and write the date the tank was last filled.

### ***Respirator Malfunction***

For any malfunction of an respirator/SCBA, such as breakthrough, face piece leakage, or improperly working valve), the respirator wearer should inform his or her supervisor that the respirator no longer function as intended, and go to the designated safe area to maintain the respirator. The supervisor must ensure that the employee receives needed parts to repair the respirator, or is provided with a new respirator.

## ***Maintenance***

Cleaning, Maintenance, Cartridge Change Schedules, and Storage:

Cleaning - Respirators are to be regularly cleaned and disinfected using approved alcohol wipes.

Monthly:

The following procedure is to be used when cleaning and disinfecting respirators:

- Disassemble respirator, removing any filters, canisters, or cartridges.
- Wash the face piece and associated parts in a mild detergent with warm water. Do not use organic solvents.
- Rinse completely in clean warm water.
- Wipe the respirator with disinfectant wipes (70% Isopropyl Alcohol) to kill germs.
- Air dry in a clean area.
- Reassemble the respirator and replace any defective parts.
- Place in a clean, dry plastic bag or other airtight container.

Note: The Program Administrator will ensure an adequate supply of appropriate cleaning and disinfection materials at the cleaning station. If supplies are low, employees should contact their supervisor, who will inform the Program Administrator.

## **Maintenance**

Respirators are to be properly maintained at all times in order to ensure that they function properly and adequately, protect the employee. Maintenance involves a thorough visual inspection for cleanliness and defects. Worn or deteriorated parts will be replaced prior to use. No components will be replaced or repairs made beyond those recommended by the Manufacturer. All major repairs will be performed by the Manufacturers' Authorized Service Center.

The following checklist will be used when inspecting respirators:

Face piece:

- Cracks, tears, or holes
- Facemask distortion
- Cracked, or loose lenses/face shield

Headstraps:

- Breaks or tears
- Broken buckles

Valves:

- Residue or dirt
- Cracks, or tears in valve material

Filters/Cartridges:

- Approval designation
- Gaskets
- Cracks or dents in housing
- Proper cartridge for hazard

Cartridge Change Schedule

Employees wearing respirators shall change the cartridges on their respirators when they first begin to experience difficulty breathing (i.e., resistance) while wearing their masks.

DO NOT USE CARTRIDGES BEYOND THE MANUFACTURER DATE CODE.  
CHANGE SCBA AIR TANKS WHEN ALARM GOES OFF.

***SCBA Air Tanks:***

Air tanks for breathing air are available in different materials. The first generation air tanks were made of steel. In order to reduce the weight of SCBA units the next tanks were made of aluminum. These were lighter in weight, generally of the same size, and painted the same color as the steel tanks.

The next generation was even lighter in weight being made from a thin shell of aluminum with an outer coating of fiberglass (referred to as composite tanks). The latest generation of composite tanks, usually used by fire fighters, is called the “stealth” tanks. These tanks have a thin wall of Kevlar and are wrapped with carbon fibers. Again, very light weight and very expensive.

The breathing air tanks are pressure tanks and as such fall under the responsibility of the Department of Transportation (DOT).

Testing:

As pressure tanks are filled, they expand. As they are used, they contract. As long as the tank continues to expand and contract there will be no problem. To ensure that the tank maintains its elasticity, the DOT requires hydrostatting or testing of these tanks at regular intervals.

The intervals for testing these tanks are as follows:

Non-Composite Tanks:

- Steel Tanks – 5 years
- Aluminum Tanks – 5 years

### Composite Tanks:

- Aluminum tank wrapped with fiberglass – 3 years
- Kevlar Tank wrapped with carbon fibers – 3 years

The size of the tanks and the air pressure in the tanks dictate the amount of air that the tanks could contain. The tank sizes are as follows:

- 30-minute tanks contain 45 cubic feet of air under pressure of 2216 psig.
- 45-minute tanks contain 60 cubic feet of air under a pressure of 3000 psig.
- 60-minute tanks contain 90 cubic feet of air under a pressure of 4500 psig.

The 30-minute and 45-minute bottles are interchangeable on the backpack assemblies due to the fact that the regulators will handle either pressure bottle. The 60-minute bottles and regulators are not interchangeable with other lower pressure bottles. (See following illustration of Air Tank Capacities).

### Defective Respirators:

Respirators/SCBA's that are defective or have defective parts shall be taken out of service immediately. If during an inspection, an employee discovers a defect in a respirator, he/she is to bring the defect to the attention of his or her supervisor. Supervisors will give all defective respirators to the Program Administrator. The Program Administrator will decide whether to:

- Temporarily take the respirator/SCBA out of service until it can be repaired.
- Perform a simple fix on the spot such as replacing head straps.
- Dispose of the respirator due to an irreparable problem or defect.

When a respirator is taken out of service for an extended period of time, the respirator will be tagged out of service, and the employee will be given a replacement of similar make, model and size. All tagged out respirators will be kept in the storage cabinet inside the Program Administrator's office.

### Emergency Malfunctions:

An operator must be prepared to take emergency action in the event that the self-contained breathing apparatus malfunctions.

Some causes might be:

- Regulator malfunction
- Face piece dislodged from the face
- Lens pop out
- Tank runs out of air
- The breathing tube develops a leak.

If the regulator sticks are closed, you can use the bypass control.

If the regulator stick opens, close the cylinder tank valve to regulate the flow to satisfy the breathing requirements.

If the face piece is pulled from the face or the face piece lens breaks or pops out, you can breathe directly from the breathing tube.

If the breathing tube develops a leak, you can hold your hand over the leak.

If the tank runs out of air, it is an indication that either the alarm malfunctioned or the operator did not hear or heed the alarm. In this case, the operator should immediately exit the contaminated area.

### ***Training***

The Program Administrator will provide training to respirator users and their supervisors on the contents of the Gartner Refrigeration Seating Respiratory Protection Program and their responsibilities under it, and on the OSHA Respiratory Protection standard. Workers will be trained prior to using a respirator in the workplace. Supervisors will also be trained prior to using respirator in the workplace or prior to supervising employees that must wear respirators.



## **Hot Work Program**

### ***Introduction***

Anytime work with equipment that provides a spark or open flame, or a work procedure that generates excess heat is done, this process is known as "Hot Work". Hot work includes:

Cutting  
Brazeing

Grinding  
Welding

Riveting  
Soldering

Rather than accept the fact that accidents happen, this How Work Program will require the issuance of a HOT WORK PERMIT.

When "Hot Work" is to be performed, the employee performing the hot work shall complete a "Hot Work Permit" before commencing work. Upon completion of the work, the permit shall be turn into the permit issuer. Permit issuer shall retain the permit for a minimum of two (2) months from the date of return.

A new permit shall be completed when there is an interruption in the work process, such as the end of a shift, or changes in the work area.

### ***Fire Prevention and Protection***

1. The affected area(s) shall be inspected and resulted documented on the Hot Work Permit before beginning hot work activities.
2. All moveable fire hazards in the vicinity shall be moved at least 35 feet from the work site.
3. Papers and other combustibles or flammables that cannot be moved shall be isolated from the ignition source by flameproof covers or otherwise shielded with metal or fire-resistant guards or curtains.
4. Appropriate fire extinguishing equipment shall be readily available for use whenever Hot Work is preformed.
5. A fire watch standby shall be provided when Hot Work is performed where there is a potential for a fire for a minimum of thirty (30) minutes after the completion of the Hot Work activities.
6. Compress gas cylinders must be labeled and inspected before each use.
7. When working with flammable or toxic materials / container the following precautions shall be taken:
  - Materials / Container shall be disconnected or blanked off.
  - Materials / Container shall be cleaned of the flammable or toxic materials.
  - Materials / Container shall be purged with an inert gas. After purging is completed, the atmosphere in the container shall be sampled to ensure it is safe for Hot Work.
8. Adequate ventilation (natural, mechanical) or respirator shall be provided for all Hot Work.

### ***Employee Protection***

1. All outer clothing shall be free from oil or grease.

2. Synthetic or plastic clothing shall not be worn.
3. Personal Protective Equipment (eye protection, gloves, footwear, etc.) shall be used as needed.
4. Long sleeve shirts shall be worn with sleeves and collars buttoned.

### ***Training***

Any person conducting hot work operations must be certified in the operations they are conducting.

The employee at the employee cost must obtain certification.

- This certification can be attained at the local Joint Apprentice Technical School (JATC).



## **Hot Work Permits Procedure**

### ***Hot Work Operations:***

Any operation that could cause a source of ignition in a hazardous area. A hot work permit is required for any hot work operations.

### ***Process:***

All activities that involve the receipt, storage, handling, compression, or movement of ammonia, including utility systems, required for the safe operation of the ammonia facility.

### ***Source of Ignition:***

A source of ignition is a flame, tool spark, static electric charge, or electric spark that would cause a fire or explosion.

#### Example:

- Welding, burning, brazing, soldering, or any use of an open flame;
- Metal removing such as drilling, chipping, abrasive cutting, milling, grinding, etc.;
- Internal combustion engines;
- Explosive-actuated fastening tools;
- Cutting or chipping concrete with or without reinforcements;
- Operating non-explosion-proof equipment and tools in an explosion-proof area. Includes battery powered equipment and tools;
- Operating any cleaning device utilizing a metal or any other material contract that can produce sparks; and,
- Work on live electrical circuits of any voltage in hazardous locations.

The hot work permit procedures that should be followed can be outlined by the following major steps:

- 1) Initiating a Hot Work Permit
- 2) Issuing a Hot Work Permit
- 3) Performing Hot Work
- 4) Completing the Hot Work Permit Procedure

Several different persons and departments may also be involved. The following information describes the responsibilities at various levels in the organization for the major steps in the hot work permit procedure.

### ***Initiating a Hot Work Permit***

The request for a hot work permit may be made by any facility employee or by Gartner if they feel that an operation presents an unusual hazard that requires special safety precautions. A hot work permit is required for any operation that could cause a source of ignition in a hazardous area. The request for a hot work permit should be submitted (verbally or in writing) to the site maintenance supervisor on the day that the hot work is to be performed.



## ***Issuing a Hot Work Permit***

- a) The site maintenance supervisor has the responsibility to fill out the hot work permit once a request for a hot work permit is made. The permit should be filled out before the hot work is started. The site maintenance supervisor should inspect the work area before filling out the hot work permit.
- b) The hot work permit should show the date and time that the work will be performed, the location, a short description of the work to be performed, the name of the cutter/welder, and the name of the fire watch (if one is required). A fire watch is required in locations where a minor fire might develop, where there are wall or floor openings within 35 feet, or where there is a presence of combustible material within 35 feet of the hot work (29 CFR 1910.252 (a)). The hot work permit is valid only for the job and the time listed in this section. It is suggested that the hot work permit should be valid for no longer than an eight hour shift, but may have a shorter valid period.
- c) The site maintenance supervisor to review the list of hot work precautions with the cutter/welder and with the fire watch (see *Form*). These precautions are summarized in checklist form on the hot work permit (see Section 2 of Form), posted in the maintenance shop, and to be posted on the equipment where the work is to be performed. Note that the hot work precautions outlined in Section 2 of the form are minimum precautions; additional measures for safety of personnel or property may be taken by the site maintenance supervisor as deemed necessary.
- d) After the site maintenance supervisor is assured that all necessary hot work precautions have been taken, he/she should initial each item in Section 2 of the permit, sign the permit, and then issue it to the cutter/welder. The cutter/welder and the fire watch should sign Section 1 indicating that they have reviewed the hot work precautions with the supervisor and understand their responsibilities. Site maintenance supervisor should make and keep a copy of the permit.

## ***Performing Hot Work***

- a) The cutter/welder should affix the hot work permit and the hot work precautions to a visible place in the work area. The permit should remain in this place until the hot work is completed. The cutter/welder is responsible for conducting the hot work within the authorized parameters and time limit set by the permit. Hot work may continue as long as conditions remain safe and no new hazards (such as ammonia leaks) have been introduced.
- b) The following precautions should be taken when performing any hot work operations
  - Perform hot work in the maintenance shop except when the job cannot be moved to the shop.
  - Use only equipment that is in good condition. Valves, regulators, hoses and torches should be thoroughly checked.
  - Do not perform portable welding, cutting, or other hot work equipment in a building where sprinklers are out of service.
  - Move combustibles at least 35 feet from hot work operations. If combustibles cannot be moved, they should be protected by metal guards or by flame proof curtains or covers rather than by ordinary tarpaulins.
  - Do not perform hot work in or on any vessels containing flammable or combustible materials (includes ammonia) including residues, until they have been disconnected or blanked, completely cleaned out, and purged. Safe Work Practices for Opening of System should be adhered to.
  - Check the atmosphere for combustible gases or vapors, where necessary, using reliable combustible gas (ammonia) detection equipment. If there is a chance of gas

release during hot work operations, continuous-duty portable combustible gas detectors should be used to continuously monitor the area.

- Ensure that a fire extinguisher, a small hose and/or bucket of sand are readily available for instant use in the area.
  - Do not perform hot work until surrounding floors have been swept clean, and, if combustible, wet down with water.
  - Do not perform hot work until all wall and floor openings within 35 feet of the operations have been tightly covered or otherwise protected with metal guards or flame proofed tarpaulins.
  - Do not perform hot work until a fire watch has been assigned to watch for dangerous sparks in the area and on floors above and below the operation.
  - Secure gas cutting and welding cylinders so they will not be damaged and replace protective caps (and closed gas supply valves) on all cylinders not actually in use.
  - Carefully and securely connect the ground clamp when using electrical arc welding equipment. Since improperly made ground can be a source of ignition, the ground clamp should be connected as close to the work as possible so that it may easily be observed.
  - Use portable stands to elevate welding hose or cable off floor areas to avoid damage to the hose or cable.
  - Ensure adequate ventilation is maintained during hot work operations to assure that personnel are not exposed to harmful fumes. This may include positioning of an exhaust blower close to the point of the exhaust fumes. Respiratory protection should also be considered.
  - Remove all electrodes from the holders, carefully locate them so that accidental contact cannot occur, and disconnect the welding machine from the power source if hot work is to be suspended for any substantial period (e.g., lunch or overnight).
- c) The fire watch shares the responsibility for fire/safety with the cutter/welder. The fire watch should maintain a constant vigil during the operation (including lunch and coffee breaks) to watch for stray sparks, ignition sources, or other fire hazards. This individual should be specifically trained in the use of a fire extinguisher, small hose and/or bucket of sand and should stay with this equipment. He/she should be familiar with the facilities and also know how to sound the fire alarm. It is the fire watch's responsibility to try to extinguish any fires if they occur, as long as they are within the capacity of the equipment available, or otherwise sound the fire alarm.

The site maintenance supervisor should inspect the work area during the hot work operations to ensure that the conditions of the hot work permit are being fulfilled.

### ***Completing the Hot Work Permit Procedure***

- a) When the hot work is completed, the cutter/welder and the fire watch should remain for at least another 30 minutes, carefully inspecting the work area and adjacent areas for the possibility of any smoldering fires. This inspection extends to floors above and below the work area and to adjacent rooms.
- b) Barring any fires, the cutter/welder then removes the hot work permit. The cutter/welder should sign Section 3 of the permit, write the completed time and then return the permit to the site maintenance supervisor.
- c) The site maintenance supervisor, the cutter/welder, or the fire watch should return to the area two to four hours later; smoldering fires may take that long to become apparent. After this final inspection, the site maintenance supervisor should sign Section 3 of the hot work permit,

write the time the system was inspected, and retain the permit in the maintenance files as a record of the work.

## ***Personnel Responsibilities***

The following describes the various persons/departments who may be involved in the hot work permit procedure, and summarizes their responsibilities.

### **Originator**

- Identifies the need for a hot work permit;
- Submits hot work permit request (verbally or in writing) to site maintenance supervisor; and
- Works with other departments, as assigned, during the implementation of the hot work permit procedure.

### **Site Maintenance Supervisor/Customer**

- Has overall responsibility for ensuring that the hot work permit procedure is followed at the facility;
- Inspects the work area before filling out the hot work permit;
- Makes a determination as to whether a fire watch is necessary;
- Completes Sections 1 and 2 of the hot work permit after completing inspection of work area;
- Reviews the list of hot work precautions with the cutter/welder and the fire watch;
- Specifies any additional precautions that may be necessary for the hot work permit;
- Signs the hot work permit and issue it to the cutter/welder when assured that all necessary hot work precautions have been taken;
- Inspects the work area during the hot work operations to ensure that the conditions of the hot work permit are being fulfilled;
- Returns to the hot work area (or direct cutter/welder or fire watch to return to the area) two to four hours later to inspect for smoldering fires; and,
- Signs Section 3 and file the hot work permit after the final site inspection has been completed.

### **Cutter/Welder**

- Reviews the list of hot work precautions with the site maintenance supervisor and sign Section 1 of the permit;
- Affixes the hot work permit and the hot work precautions to a visible place in the work area;
- Conducts the hot work operations within the authorized parameters and time limit set by the hot work permit;
- Stops hot work operations if any new hazards are introduced to the process;
- Remains in the area for 30 minutes after work is completed, carefully inspecting the work area and adjacent areas for any smoldering fires;
- Signs and return the hot work permit to the site maintenance supervisor after the 30 minute inspection; and,
- Returns to hot work area two to four hours later to inspect for smoldering fires if instructed to do so by the site maintenance supervisor.

### **Fire Watch**

- Reviews the list of hot work precautions with the site maintenance supervisor and sign Section 1 of the permit;
- Maintains a constant vigil during the hot work operations (including lunch and coffee breaks) to watch for stray sparks, ignition sources, or other fire hazards;

- Ensures that a fire extinguisher, a small hose and/or bucket of sand are readily available for instant use in the area;
- Stops hot work operations if any new hazards are introduced to the process;
- Extinguishes any fires if they occur as long as they are within the capacity of the equipment available, or otherwise sound the fire alarm;
- Remains in the area for at least 30 minutes after work is completed, carefully inspecting the work area and adjacent areas for any smoldering fires; and,
- Returns to hot work area two to four hours later to inspect for smoldering fires if instructed to do so by the site maintenance supervisor.

# HOT WORK PERMIT FOR CUTTING AND WELDING WITH PORTABLE GAS OR ARC EQUIPMENT

## SECTION 1

Issued By: \_\_\_\_\_

Date: \_\_\_\_\_

Permit Expires: \_\_\_\_\_

Building: \_\_\_\_\_

Work Dates: \_\_\_\_\_

Dept.: \_\_\_\_\_

Floor: \_\_\_\_\_

Work to be Done: \_\_\_\_\_  
\_\_\_\_\_

Type of Work: ☐ Cutting ☐ Welding ☐ Retrofit ☐ New

Work Performed By: ☐ In House People ☐ Outside Contractor(s)

Cutter/Welder Name: \_\_\_\_\_

Is work to be done on ammonia refrigeration piping or equipment? ☐ Yes ☐ No

Is fire watch required? ☐ Yes ☐ No If yes, Name: \_\_\_\_\_

Is there overhead work? ☐ Yes ☐ No

Relocation of combustible materials? ☐ Yes ☐ No

Protective covering used? ☐ Yes ☐ No

Is there equipment to convey sparks? ☐ Yes ☐ No

Type of fire extinguisher required. ☐ A ☐ B ☐ C ☐ ABC

Was training required? ☐ Yes ☐ No

If so what type of training? \_\_\_\_\_

Describe precautions required with any combustible materials:

☐ Floors? \_\_\_\_\_

☐ Walls? \_\_\_\_\_

☐ Ceilings? \_\_\_\_\_

☐ Roof? \_\_\_\_\_

☐ Atmosphere? \_\_\_\_\_

## SECTION 2

### ATTENTION

Before approving any cutting and welding permit, the fire safety supervisor or his appointee shall inspect the work area and confirm that precautions have been taken to prevent fire in accordance with Hot Work Procedures, OSHA's 1910.252(a) and the National Fire Protection Association's standard 51B, Cutting & Welding Processes.

### PRECAUTIONS

- ☐ Sprinkler in service.
- ☐ Cutting and welding equipment in good repair.

### WITHIN 35 FT. OF WORK AREA

- ☐ Floors swept clean of combustibles.
- ☐ Combustible floors wet down, covered with damp sand, metal or other shields.
- ☐ No combustible material or flammable liquids.
- ☐ Combustible and flammable liquids protected with covers, guards or metal shields.
- ☐ All wall and floors openings covered.
- ☐ Covers suspended beneath work to collect sparks.

### WORK ON WALLS OR CEILINGS

- ☐ Construction noncombustible and without combustible covering.
- ☐ Combustibles moved away from opposite wall.

### WORK ON ENCLOSED EQUIPMENT

(Tanks, containers, piping, ducts, dust collectors, etc.)

- ☐ Equipment cleaned of all combustibles.
- ☐ Opening of ammonia refrigeration systems practices followed.
- ☐ Containers properly purged of flammable liquid and vapors.

### FIRE WATCH

- ☐ To be provided during and 30 minutes after operation.
- ☐ Supplied with fire extinguishers and small water hose.
- ☐ Trained in use of equipment and in sounding fire alarm.

## SECTION 3

### FINAL CHECK-UP

Work area and all adjacent areas to which sparks and heat might have spread (including floors above and below and on opposite sides of walls) were inspected 30 minutes after the work was completed and were found firesafe.

The location where the work is to be done has been examined, all necessary precautions taken and permission is granted for this work.

Site Inspection Date/Time:

Issued By:

Contractor:

Fire Watcher:

THIS FORM SHOULD BE KEPT ON FILE FOR 30 DAYS AFTER ALL WORK IS COMPLETED.



## **Employee Training Plan**

1. All Gartner Refrigeration Service Technicians, Field Superintendents and Foremen shall receive training and certification for the OSHA 24 Hour prescribed Ammonia Emergency Response Team Training on accordance with OSHA 1910.120.
2. All Gartner Service Technicians, Field Superintendents and Foremen, shall receive 8 hours per year Refresher Training on Ammonia Emergency Response.
3. Employees are responsible for adhering to all safety regulations specified in the Gartner and/or MCA (mechanical Contractors Association) Employee Training Manual.
4. All job superintendents/foremen are responsible for holding weekly job safety meetings using either MCA "Tool Box Talk" sheets, MCA "Safety Manual for the Mechanical Trades" or Kellers "Official OSHA Safety Handbook.
5. Asbestos Safety Policy must be complied with, read and verification signed.
6. Lock Out/Tag Out Safety Procedure must be complied with, read and verification signed.



## **Asbestos Policy**

If you are working in an area where you know there is asbestos, or even suspect asbestos, you must stop working and notify your foreman/supervisor.

You will not go back to work in the area until the material has been positively identified as not being asbestos, the material has been encapsulated, or the material has been removed. If the material is encapsulated or removed, the area must have been monitored and found safe per the existing regulations put out by the EPA and OSHA.

On an infrequent basis you may work in an area where there is asbestos. Only workers who have attended asbestos training will be authorized to work in these areas. Even those workers will not, while in the employment of Gartner Refrigeration, intentionally remove, or disturb asbestos materials.

Asbestos causes adverse health effects on the respiratory system and can cause respiratory disease known as asbestosis and is a recognized cause of malignant mesothelioma. Symptoms may not appear for about 12-20 years.

Gartner Refrigeration employees will only mark areas needing to have asbestos removed and then they will leave the area while the actual abatement is taking place. If you have reason to believe that pipe/insulation or ceiling material is contaminated with asbestos, you may not remove the insulation or ceiling, under any circumstance. If, however, based on previously obtained air sample or other reliable data, you believe that work space air quality is within OSHA guidelines, you may work in the work area as long as you do not disturb any asbestos containing materials and as long as you adhere to other portions of this policy.

In order to be doubly safe, we are also going to require people who are working in an area where asbestos is known to exist, has been encapsulated, or has been recently removed, to wear respirators. This precaution is not required by law but is required by Gartner Refrigeration.

All employees that work in an area that contains asbestos will be required to have asbestos training. They may be required to take a physical prior to beginning work. The training will be documented and maintained in the Gartner Refrigeration Office.

**THIS IS A MANDATORY POLICY. NO EXCEPTIONS WILL BE PERMITTED**





## Standard Operating Procedures

### *SOP - Charging Ammonia Into System*

#### Equipment

Charging valves on equipment or at side of refrigeration building.

#### Operator Requirements

Operator training is required for this procedure. The training can be from on the job experience or classroom instruction.

Procedure requires two persons to conduct; One (1) Gartner Technician and One (1) trained ammonia delivery person.

#### PPE Required for each Gartner Employee

Butyl rubber gloves  
Full-face canister respirator  
Face shield  
Goggles

#### Tools/Equipment Required

1 pipe wrench 10"  
1 crescent wrench  
Purging hose  
Purge bucket, 1/2 filled with water

#### Special Safety and Health Considerations

1. Anhydrous ammonia liquid quickly vaporizes once exposed to normal atmospheric temperature and pressure. The vapor is lighter than air and will quickly accumulate near ceilings and other high places. It is highly corrosive to skin and can cause irreversible damage to eyes. Avoid inhaling, skin contact, eye contact, and ingesting. Remove from exposure, if inhaled. Flush skin or eyes with water for 15 minutes. Do not induce vomiting if ingested, give 1 – 2 glasses of milk or water. In all cases, medical aid should be sought.
2. Associates who work with ammonia must not have any physical limitations that interfere with the use of proper respirators. Contact lenses should not be worn by those working with ammonia.
3. Ammonia has an explosion potential in confined spaces and can react violently with strong acids.
4. Flames should be extinguished.
5. Ammonia vapors can be controlled with a water fog or spray. **Do not put water on liquid ammonia.**

## Safety Systems

1. Trained emergency response team personnel is the Local Fire Department
2. State of the art ammonia detection system.
3. Emergency shutdown system in place and activated by pullboxes located in

## Other Information

The company supplying the ammonia will have its own Standard Operating Procedure. Attached is a copy of LaRoche's SOP which is subject to change without notification to Gartner or also another supplier could be used.

STEP NUMBER	PROCEDURE DESCRIPTION
Ammonia	Truck bulk delivery
1	Insure that appropriate plant operators are aware of a bulk delivery 24 hours in advance.
2	Response personnel are to be ready with ammonia safety equipment.
3	Delivery driver is shown connecting location and receiving vessel and informed about its pressure and location of safety shower/eye wash stations.
4	Gartner Refrigeration and Building Maintenance Planner removes lockout on receiving connection valve. Valve remains closed.
5	Delivery driver connects his transfer hose to plant connection point.
6	Delivery and Gartner personnel must equip themselves with Personal Protective Equipment (PPE).
7	Install check valve between system and charging hose
8	Delivery driver performs his hose purge and truck hose valve operations and checks for leaks.
9	Delivery driver opens the outside charge line valve and checks for leaks.
10	Delivery driver starts delivery pump.
11	Gartner operator watches the level in the receiving vessel to insure that 80% liquid level is not exceeded.
12	When proper amount has been received, delivery driver shuts off delivery pump.
13	Delivery driver shuts outside charge line valve.
14	Delivery driver performs his connection purge and other necessary functions.
15	Delivery driver disconnects delivery hose.
16	Refrigeration operator inspects connection point for leakage.
17	When all is ok, operator caps charge line valve
18	Refrigeration Technician and delivery driver complete all necessary paperwork

STEP NUMBER	SYSTEM CHARGING FROM CYLINDER:
	NOTE: It is the intent not to use cylinders. This procedure is in the event the Refrigeration and Building Maintenance Planner and Environmental Engineer determine to use cylinders.
1	All cylinders are to be properly secured to prevent them from being knocked over.
2	Alert support person who has had Emergency Response training.
3	Move cylinder in cart to charging location near POC (pump out compressor)
4	Secure proper transfer hose and all necessary tools.
5	Dawn PPE i.e. gloves, full face canister respirator or face shield & goggles
6	Install check valve on the liquid line access valve.
7	Install stop valve on the end of the hose near access valve. (Use this valve to purge hose into barrel of water when done).
8	Connect hose to check and access valve.
9	Connect other end of hose to cylinder outlet, with outlet pointed upward (this positions the cylinder dip tube downward).
10	Open hose purge line and place its tubing or hose into bucket half full of water.
11	Crack open valve on cylinder and reclose it, check for leaks
12	Close purge valve.
13	Close receiver King valve
14	Position cylinder cart so cylinder head is slightly lower than its bottom and the outlet remains points upward.
15	Open cylinder valve
16	Remain in the immediate area until operation is completed.
17	When cylinder reaches the operating pressure of the Low Temperature system, shut the cylinder valve
18	Shut the access valve to the liquid line.
19	Open receiver King valve
20	Purge the connection hose into a barrel of water.
21	Remove hose form cylinder and check valve from system.
22	Install cover cap over cylinder valve.
23	Mark cylinder as empty.
24	Put hose and other tools away.



## ***SOP - Cut-In Procedure – Ammonia Tie-In***

Tie In Location

**Refer to: OSHA 29 CFR 1910.119 (f) – Operating Procedures (Be certain all areas of this element are included).**

1. Confirm the location for tie-in and the size of isolation valve(s) to be added per Gartner drawings and project engineer connecting into an existing system, consider installing a shut-off valve at the tie-in point. Consider installing tie-in valve(s) first, so planned system modifications can proceed without interrupting the system operation.
2. Coordinate the tie-in with plant operations. Consider the shutdown time necessary to make the required tie-in and the effect on facility production or storage temperatures.
3. Develop written procedures for testing the newly installed piping and equipment.
4. For all system modifications, follow "Management of Change" procedures. (See IIAR Process Safety Management Guidelines; OSHA 29 CFR 1910.119 Process Safety Management of Highly Hazardous Chemicals.) Ensure that all designs and installations are reviewed by the jurisdictional authority.

Prior To Pump Out

### **"HOT WORK PERMIT" PER SITE GUIDELINES Refer to OSHA 29 CFR 1910 (k)**

Always reduce the system and equipment internal pressure to 0 psig before the tie-in process is started. "Hot Tap" tie-ins are a last resort option. "Hot Taping", if necessary, shall follow industry published guidelines, for example, API Publication 2201.

Prepare the equipment required for the pump-out procedure. Verify that all personal protective equipment is functional. Consider the following, as applicable:

1. Location and readiness of respirator protection equipment (SCBA or other respirator). Select respiratory protection as appropriate for escape, response, or nuisance exposure.
2. Goggles, safety shields, gloves.
3. Water hose.
4. Portable ventilation equipment.
5. Fire extinguisher.
6. Appropriate protective clothing.
7. Two-way radios.
8. Availability of trained back-up personnel in case of emergency.

All personnel involved in work shall be properly trained in the use of necessary personal protective equipment.

1. Review the pump-out procedure and tie-in procedure with personnel. Also review the facility Emergency Planning and Response Plan, making sure all personnel involved know what they are to do if an emergency occurs.
2. Identify the valves, piping and connected equipment that will be shut down. Use Lockout/Tagout procedures in shutting down any portion of the system or equipment. Be careful.

## Pump-Out

1. Monitor temperatures and pressures during the pump-out process.
2. Shut off the liquid feed to the portion of the system in which the tie-in is to be made.
3. Continue operating any evaporators that will facilitate refrigerant evaporation.
4. Have a 30 inches Hg to 150 psig (compound) gauge connected to the portion of the system being pumped out.
  - Pump-out until the pressure is below 0 psig, and (if appropriate)
  - down to 15-20 inches Hg. Let the pump-out
  - Let the system stand for several hours, overnight if possible. This will allow remaining liquid refrigerant to vaporize.
  - Any signs of frost on un-insulated piping or valves may indicate that liquid ammonia is present. If this condition persists after several pump-out attempts, check for leaking stop valves.
5. After the pump-out process, the system pressure shall be adjusted to near 0 psig before any cut-ins is made. It is not advisable to have a deep vacuum when the system is cut into because air mixed with any residual oil and ammonia can form an explosive mixture. It is recommended that dry nitrogen be used to raise the pressure to just above 0 psig.

## **LOCK OUT/TAG OUT Refer to OSHA 29 CFR 1926.417**

### Pump-out when system liquid storage capacity is inadequate

1. The system does not have liquid storage capacity to pump-out existing piping and equipment, it will be necessary to transfer excess ammonia into a temporary storage vessel or tanker truck.
2. Develop written procedures for the safe transfer of ammonia from the system. In the procedure consider the following:
  - All personnel involved shall use personal protective equipment: SCBA, or other appropriate respiratory protection, protective gloves, protective boots, and protective goggles.
  - Barricade area from traffic and unauthorized personnel while transfer is occurring.
  - Visually inspect and pressure test all transfer hoses and fittings.
  - There should be a functional permanent or portable eye wash and shower available.
  - Know what to do, and where to go if an ammonia release occurs.
  - Never leave the transfer process unattended. Monitor temperatures and pressures during the pump-out and transfer.

## Tie-In

1. Piping insulation should be removed in the vicinity of the tie-in point.
  - i. Approximately 3 feet on each side of the tie-in point is recommended.
2. Follow Hot work Permit Procedures before any cutting, burning or welding is one.
3. Use appropriate personal protective equipment, even if the line is believed to be
  - i. entirely pumped down. Never assume that a line has been completely emptied of
  - ii. residual water, oil, and ammonia.
4. Portable fans are useful to direct vapors away from the work area.
5. Have all materials ready. Flange style isolation valves should have a short pipe section connected to it or a piece of pipe with valve flange connected.

6. Introduce a slow flow of dry nitrogen into the isolated section, allowing the pressure to escape through a small vent valve located at the opposite end of the piping section. Do not use air in the place of nitrogen. There should be a slightly positive nitrogen pressure in the system during the hot work. If nitrogen is not available, open a valve to atmosphere so pressure remains near atmospheric.
7. The actual cut-in and welding work should be done by certified and experienced persons.

#### Testing

1. For a initial test, introduce dry nitrogen into the new portion of the system. Test for leaks at pressures specified in the design or governed by applicable codes. Test for leaks using soap bubble solution. Hold the pressure for 24 hours when feasible. If the pressure falls more than five psi (compensating for temperature changes that may occur), re-check system for leaks. Repair all leaks and re-test as necessary.
  - After the system has been pressure tested, release pressure and re-pressurize with approximately 30 psig of ammonia, then boost the system pressure to at least 100 psig with nitrogen. Test for leaks using litmus paper or sulfur sticks.
  - Where the use of dry nitrogen is not practical. Use ammonia for the leak test. Use sulfur sticks or litmus paper to locate leaks.
2. After the pressure test and leak test are documented, release the ammonia/nitrogen mixture according to applicable codes. Notify appropriate authorities and utilities.
  - Remove all Lockout/Tagout tags.
3. Complete all Management of Change, Pre-Startup Safety procedures, and Training necessary for system addition. Perform Mechanical Integrity Audit (safety check) of all new equipment, piping, vessels, etc.

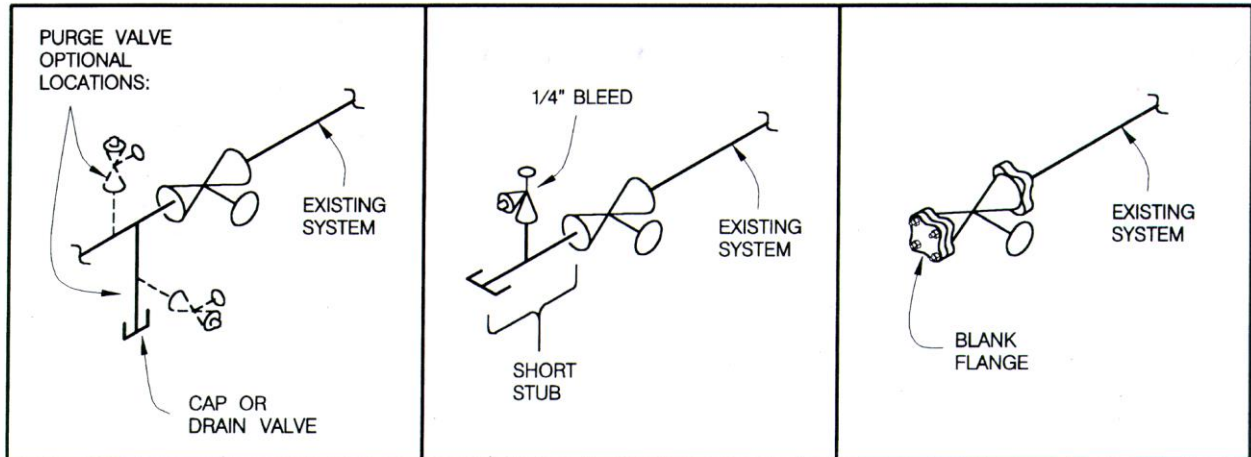
#### Bring On-Line **Following Site Standard Operating Procedures OSHA 29 CFR 1910.119 (f) and 29 CFR 1910.119 (i) pre-safety startup.**

1. Before bringing the new system addition on-line, purge the non-condensable gas.
2. Following testing, the system addition should already be at or near 0 psig. If not, purge the remaining pressure. Again, notify appropriate authorities and utilities.
  - Pump-out the system using a vacuum pump that is appropriate for ammonia. This should not be done with the system compressors. If available, use a water jet style pump, which absorbs ammonia.
  - Before bringing the system addition on-line, properly label and tag new piping, valves, and equipment.
3. New equipment should be brought on-line in a logical and sequential order so as to not overload compressor
4. Slowly adjust the system suction pressure. Monitor the effect on the original system.

#### Planning For Future Expansion

1. Determine locations and size for extra valves that could facilitate future expansion. Consider what portions of the system or equipment might have to be isolated or shut down to make a tie-in an extra valve is not installed during original construction.
2. Determine locations for purge/pumpout connections. For those portions of the system or equipment that will have primary isolation valves, install purge valves to assist in the pump-out of that section of piping or equipment.

3. Size dead-end valves on main line stubs to which future connections are made. The size of the valve should be large enough to handle expected future capacity at an acceptable pressure loss. Consider the direction of flow and valve orientation when installing valves. If possible, the source of pressure or flow should come up under the valve seat. Main line dead-end valves should be plugged, blank-flanged, or have a short stub with a 1/4" bleed valve with gauge. See examples and Notes below:



- NOTE:**
- a. For dead-end valves, if a pipe stub is connected to the valve it should be approximately 12" long. The added length of the stub, plus the use of a heat sink (like a wet rag) will reduce the possibility of damage to the valve seat when a future connection is made to the pipe stub.
  - b. Ensure that safe operating procedures (including lockout/tagout) are established and adhered to for dead-end valves.
  - c. For a dead-end liquid valves, do not open the valve and then close the valve leaving liquid trapped, unless some means is provided to relieve pressure.
  4. Analyze possible future facility load additions that could reasonably be expected to occur. Consider providing future tie-in valves at the following locations:
    - End of main headers
    - Connection off of main headers for future compressor, condensers, vessels, and other equipment
    - Future processing equipment
    - Future mechanical refrigerant pumps or liquid transfer units.
    - Consider locating valves in the system so that they could be closed to facilitate future expansion.
    - Consider installing additional valves, which could reduce the possibility of an extended or difficult shutdown.
    - Consider locating valves to avoid the trapping of liquid during future expansion.
  5. During the installation verify that all refrigerant lines and valves are properly identified. See IIAR Bulletin 114.
  6. Make tie-in locations so that proper refrigerant flow will be aided by gravity. An alternative is to design for added pressure losses where return lines are trapped.



## ***SOP - Ammonia Removal***

1. Pump down the system using the system compressor(s).
2. Remove liquid ammonia from refrigeration system.
3. Evacuate pocketed ammonia as much as possible to attain near zero charge on the system.
4. Schedule transport trucks to dispose of ammonia properly.
5. Use top of tanker truck vent to plant low side suction (1" hose minimum)
6. Liquid hose (1" hose minimum) to truck pump.
7. Drain oil from oil pots (oil holds ammonia).
8. Drain oil from all compressors
9. When system is empty, dispose of residual of ammonia and nitrogen by using 100 gallons of water to 1 gallon of ammonia bubbling slowly into a 55 gallon barrel full of water. Tie the ammonia hose so it doesn't jump out. Place the 55-gallon barrel close to a Sanitary Drain and run water constantly to maintain 100 gallons water to 1-gallon ammonia ratio. Do not discharge to a storm sewer.
10. Place Stokes vacuum pump on system placing pump discharge and hose into 55 gallon barrel of constant water running down drain.
11. Use eight (8) packs of nitrogen to dilute ammonia when system is near empty.
  - (1) 8 pack per 5,000 lb. ammonia system
  - (2) 8 packs per 10,000 lb. system
12. Dump nitrogen ammonia press mix into water.
13. Isolate compressors properly.
14. Leave compressor with 5-psig nitrogen.





## ***SOP - Ammonia Spills***

1. You may be taking orders from the customer's Incident Commander or the Fire Department.
2. If there is no Incident Commander, work with the Fire Department.
3. Instruct help to dam area around ammonia spill to prevent ammonia from entering storm drains.
4. Never add water to ammonia
5. Ammonia can be added to water:
  - a) Safe dilution levels of 1 gallon of ammonia to 100 gallon (25 ppm) of water can be disposed of down a sanitary sewer.
6. Never enter a leak area on SCBA without a back up man with an SCBA and life line.
7. Measure ppm of the cracked door leak with MSA "Kwick Draw" pump tube test instrument.
  - a) 25-300 ppm Use gas mask
  - b) 300-1000 ppm Use SCBA with splash suit and gloves
8. Over 1,000 ppm
  - a) Use PPV Positive Pressure Ventilation fan to lower ammonia concentration in work area (up wind) to 1000 ppm or lower.
  - b) If Test Instrument shows level near work area above 1000 ppm LEAVE AREA
  - c) Working with SCBA over 1000 ppm requires Level "A" Sealed Suits
9. If you cannot lower ppm to less than 1000 ppm:
  - a) Continue PP Ventilation until up wind level near work area drops lower than 1000 ppm (Explosive Safety Alert/4%=40,000ppm)
10. Gartner Service Personnel are **NOT** Level 'A' Responders on their **OWN**. You need back up help using FIRE DEPARTMENT or HAZMAT Team.
  - a) Work with FIRE DEPARTMENT and/or "HAZMAT" team to assist them.
11. Level 'A' Response can only be performed on customers who have a PSM\* Process Safety Management Team
12. 40,000 ppm LEAVE AREA IMMEDIATELY – **LOWER LEVEL OF EXPLOSIVE LIMIT.**  
**NOTE: Often indicated by a dense cloud filling the room to near zero visibility.**

### ***Air Monitoring (testing)***

**Take hermetic tube/pump samples through cracked open door before entering spill area.**

1%	=	10,000 ppm
4%	=	40,000 ppm Safe lower Level of Explosive Limits
35 ppm	=	P.E.L. (Personal Exposure Level) Irritation max ppm for 8 hour working conditions
25-300 ppm	=	Gas Mask Required
300-500 ppm & Above	=	SCBA use recommended (gas masks may not be adequate for all personnel)
Above 500 ppm	=	SCBA Required I.D.L.H. – Immediate Danger to Life & Health
Above 1,000 ppm	=	Level "A" Protection required by OSHA (Need back up team with Level "A" suit per OSHA) Max worker body temperature (in ear) 100°F.

### **MSA QUICK DRAW PUMP**

Note: 3 different tubes

1. MSA Tube #804405 = 2 PPM – 500 PPM
  - a. 10-600 ppm Scale N=2 – Only 2 Strokes of MSA "Kwick Draw" pump
  - b. If reading is less than 50 ppm; take 8 more strokes (total 10) and read Scale N=10.
2. MSA Tube #800300 = 20 PPM – 1000 PPM 1 stroke = 20 PPM
3. MSA Tube #804400 = 10,000 (1%) – 100,000 PPM (10%)  
1 stroke = 10,000 PPM 10 strokes = 100,000 PPM



## ***SOP - Ammonia/Oil/Solvent Disposal***

**Caution:** Wear non-vented eye goggles, face shield and rubber gloves.  
Never blow liquid into air.

### Liquid

All ammonia liquid must be transferred into:

1. Certified ammonia drums, caution, do not overfill/exceed net weight.
2. Ammonia Refrigeration vessels or piping
3. Certified ammonia tank trucks
4. Sanitary sewer
  - a. small quantities (under 10 lbs.) dilute with water, 100 gallons to 1 gallon of ammonia.
  - b. Always add ammonia to water, never water to ammonia.

**NOTE:** Never dump into storm sewer or areas that drain into storm sewers.

### Vapor Disposal

1. Into refrigeration systems, vessels and piping.
2. Into empty certified ammonia drums
3. Into certified ammonia tank trucks
  - a. check winds, clear area downwind 5,000 ft. and have watch person
4. Into air
  - a. only if small quantities (under 10 lbs.) with great caution, slowly making sure downwind area is clear with watch person.

### Oil Disposal

- Dispose oil into oil reclaim barrels designated for refrigeration oil

### Solvent Disposal

- Dispose of solvent into reclaim barrels designated
  - a. Bring used solvent to shop if customer does not have solvent recycle/reclaim system.



## ***SOP - CFC/HCFC Safety***

### CFC/HCFC AND "FREON" SUBSTITUTES HCFC\*

1. Pump out and reclaim with designated reclaimer and certified refrigerant reclaim drums.
2. Label reclaim drum with proper refrigerant number
3. Bring refrigerant to shop for recycling.
4. Return used reclaimer for shop service to clean up.
5. Check out clean reclaimer machine and empty refrigerant drums.

CFC'S & HCFC'S\* - Always follow OSHA rules on Class I & II refrigerants:

1. Do not vent to atmosphere (R12, R22, R502 and all replacements/blend refrigerants).
2. Pump out and reclaim with proper equipment.
3. Do not cross contaminate refrigerants.
4. Tag and label all refrigerant reclaim cylinders

<b>Type of air conditioning or refrigeration equipment. CFC/HCFC &amp; Blends</b>	<b>Inches of Vacuum (relative to Standard Atmospheric Pressure of 29.9 Inches Hg), using recovery or recycling equipment</b>
Equipment or isolated component of such equipment, normally containing less than 200 pounds of refrigerant	0
Equipment or isolated component of such equipment, normally containing 200 pounds or more of refrigerant	10
Other high-pressure equipment, or isolated component of such equipment, normally containing less than 200 pounds of refrigerant	10
Other high-pressure equipment, or isolated component of such equipment, normally containing 200 pounds or more of refrigerant	15
Very high-pressure equipment (condensers 300-500 psig)	0
Intermediate-pressure equipment (R114)	25
Low-pressure equipment (low temp equipment)	29

#### Industrial/Commercial CFC/HCFC Equipment\*

1. Must be repaired if total yearly leakage exceeds 35% of total charge

#### Comfort Cooling CFC/HCFC Equipment\*

1. When total charge is more than 50 lbs., unit must be repaired if the yearly leak rate exceeds 15% of total charge
2. Customer/owners must keep records of how much refrigerant is added during servicing. Owners who become aware of leaks greater than the percentages outlined have 30 days to repair the leaks or program a replacement of the equipment.

#### *For All Procedures:*

- *Always use excess ventilation with opening CFC/HCFC equipment due to residual vapors*
- *Use PPE personal protection equipment when using an open flame around CFC/HCFC*
- *Residual vapors of CFC/HCFC's may cause toxic vapors when burned with open flame*



## Company Disciplinary Policy

With any large group of people, having reasonable rules can benefit everyone. Reasonable rules help provide a safe and desirable place to work. It is the purpose of the rules to correct undesirable or unacceptable conduct for the benefit of all employees as well as the Company.

The Company Rules will be applied in a fair and impartial manner. Full consideration will be given to the nature and cause of the violation, the seriousness of the event, the likelihood that the event will be repeated, and the attitude of the violator.

It will be the responsibility of department heads, field superintendents, safety manager, controller or owners to enforce the disciplinary program.

The Company Rules are classified in three (3) categories, depending on the degree of seriousness - Type A, Type B, and Type C. The corrective action which will be taken when the Company Rules are violated during an eighteen month consecutive period follows:

### Type A

- |               |   |
|---------------|---|
| 1st Violation | - Verbal warning with notation on employee's record |
| 2nd Violation | - Written Warning                                   |
| 3rd Violation | - Three day suspension without pay                  |
| 4th Violation | - Discharge   |

### Type B

- |               |                                    |
|---------------|------------------------------------|
| 1st Violation | - Three day suspension without pay |
| 2nd Violation | - Discharge                        |

### Type C

- |               |             |
|---------------|-------------|
| 1st Violation | - Discharge |
|---------------|-------------|

### Company Rules (Type A)

1. Leaving the Company premises or clocking out of the plant without permission.
2. Leaving work area without permission of immediate supervisor. (Applies to Shop and Field Service employees only).
3. Entering or remaining in the Company premises during hours other than regular working hours and without permission or authorization of management.
4. Failing to punch time card in or out upon entering or leaving the job, including during the lunch hour, if applicable.
5. Failing to meet reasonable quality and quantity work standards.
6. Making scrap unnecessarily or careless workmanship.
7. Creating or contributing to unsanitary or unhealthy conditions.

8. Performing non-Company work on Company time or on Company premises without Company authorization.
9. Reporting to work under the influence of alcoholic beverages, narcotics, illegal drugs or controlled substances, or possessing the same on Company premises, other than prescribed drugs. (Violation of this rule will also result in the employee being suspended without pay for the remainder of the shift).
10. Soliciting membership or money in written form or otherwise in behalf of any group or organization during working hours on Company premises without Company authorization.
11. Distributing, posting, removing or defacing notices, signs, or literature on bulletin boards or in work areas without Company authorization.
12. Engaging or participating in horseplay or practical jokes which interfere with any employee's ability to carry out assigned work duties or which endanger the safety of another employee.
13. Negligently or intentionally disregarding safety rules or common safety practices that do, or would likely, result in minor personal injury or property damage.
14. Physical inspections of employees work areas will be conducted to ensure that they comply with safety rules and company policies.

#### Company Rules - Type B

1. Distribution or use of alcoholic beverages, narcotics, illegal drugs or controlled substances on Company property, other than prescribed drugs.
2. Possessing illegal firearms, weapons, or explosives on Company property.
3. Willfully refusing to obey or carry out orders of supervisors or other management personnel, or engaging in acts of insubordination.
4. Intentionally restricting, hindering, interfering with or limiting production, or attempting to influence others to do so.
5. Unauthorized or improper tampering with Company equipment or property.
6. Threatening, intimidating, coercing, using derogatory and/or abusive language or harassing any employee or member of management on Company premises.
7. Negligently or intentionally disregarding safety rules or common safety practices that do, or would likely, result in major personal injury or property damage.
8. Sleeping on the job.
9. Clocking in or out on another employee's time card, or allowing your own time card to be clocked in or out by another employee without permission of your supervisor.
10. Engaging in disorderly conduct of a gross nature on Company premises.

#### Company Rules - Type C

1. Provoking, instigating, or participating in a fight, other than in self-defense, during working hours or on Company property.
2. Using, removing or disclosing employee lists or confidential information of any nature without Company authorization.
3. Falsifying any record, including time cards and production records, or deliberately giving false information for any Company record.
4. Willfully destroying, damaging, abusing, removing or stealing any property owned, leased, rented or in the custody of the Company, or of its employees or others on Company premises.
5. Threatening any employee or member of management on Company premises with serious bodily harm.

## ***Notification of Written Warning for Violation Company Disciplinary Policy***

Employee Name: \_\_\_\_\_

You have been found in violation of a company policy. This notification will be kept on file in your employee record at our office.

VIOLATION: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Reported by: \_\_\_\_\_

Warning:    1<sup>st</sup>      2<sup>nd</sup>      3<sup>rd</sup>      (circle one)

Category:    **I**      **II**      **III**      (circle one)      Violation Date: \_\_\_\_\_

Action Taken: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Employee signature: \_\_\_\_\_ Date: \_\_\_\_\_

☐ Employee did not wish to sign

Administered by: \_\_\_\_\_

### **ACKNOWLEDGEMENT FORM**

**THIS FORM WILL BE KEPT ON FILE IN YOUR EMPLOYEE RECORD**

I acknowledge that I have received a copy of Albers Mechanical company disciplinary Policy and that I have read it and do understand said policy.

PRINT EMPLOYEE NAME: \_\_\_\_\_

EMPLOYEE SIGNATURE: \_\_\_\_\_

\_\_\_\_\_  
DATE





## **Scaffold Program**

### ***General Requirements***

Each supported scaffold must be able to support four times its "maximum intended load." Maximum intended load means the total weight of all workers, materials and equipment that will be on the scaffold at any one time. A scaffold also has to support its own weight and any force transmitted to it by means of wind, snow, ice buildup and other external forces.

OSHA requires that a qualified person must design all scaffolds. OSHA defines a qualified person as "one who by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project."

All scaffolds must be constructed within the limits of its design and loaded within its designed capacity. Only qualified and or competent personnel are allowed to modify scaffolding systems.

### ***Platform Construction***

A qualified person shall design scaffold.

Scaffold working levels need to be fully planked or decked, using scaffold planks.

There should be no more than a 1-inch gap between the scaffold uprights and decking.

- When an employer can demonstrate that a 1-inch gap or less is not feasible, the deck still needs to be planked as fully as possible. In any case, OSHA does not allow gaps of more than 9½ inches.

Scaffold platforms and walkways must be at least 18 inches wide. There are three exceptions to this rule:

- Ladder-jack, roof-bracket and pump-jack scaffolds can be as narrow as 12 inches.
- If the scaffold is erected in an area that is too narrow to accommodate an 18-inch platform, the platform must be as wide as possible and guardrails or personal fall-arrest systems must protect employees.
- The front edge of the scaffold platform should not be more than 14 inches from the face of the building. If the distance is greater than 14 inches, there must be guardrails erected along the front surface or employees must wear personal fall-arrest systems.

Platform planks have to extend a minimum of 6 inches over their supports. If they are too short, movement on the scaffold may cause them to move and fall; if they are too long, the weight distribution may cause them to tip.

- For platforms that are 10 feet or less in length, the cantilevered portion (i.e., the end that hangs over the support) should not be more than 12 inches long.
- For scaffold planks longer than 10 feet, the cantilevered portion should not be more than 18 inches long.

- Regardless of plank length, excess length of the cantilevered portion is not a problem if there are guardrails to prevent worker or material weight from being applied to the length or it is secured to the support so that it will not tip when weight is applied.

When more than one plank is used to create a longer platform, the following rules apply:

- If the planks are abutted, they must rest on separate supports. Common support members, such as T-sections, can be used, as can hook-on platforms designed to rest on the same support.
- If the scaffold changes direction, they must be put over a support by at least 12 inches. If the overlap is less than 12 inches, the planks should be nailed or otherwise restrained.
- If the scaffold changes direction, any planks that will be laid on a bearer at a right angle should be laid first. Planks that will be at a right angle should be laid on top of the first planks.
- Wood platforms cannot be covered with opaque finishes.

Platform edges may be covered or marked for identification and the platforms themselves may be painted with wood preservatives or fire-retardant finishes and slip-resistance finishes, but the coating must not obscure the top or bottom.

Unsafe equipment must be tagged “**DO NOT USE, UNSAFE**” or “**SCAFFOLD UNDER CONSTRUCTION --- STAY OFF**” by a competent person and must be complied with.

*Note: Platforms used only as walkways or by employees who are erecting or dismantling scaffolds are not considered working surfaces and are exempt from these requirements.*

## ***Component Mixing***

Scaffold components can be mixed under two conditions. The first is that the components must fit together easily and without force. Additional parts must not be modified in order to fit unless a competent person determines that the resulting scaffold will be structurally sound.

The second condition is that dissimilar metals may not be combined unless the competent person approves the match. Some metals may react to one another and weaken the scaffold.

## ***Supported Scaffolds***

Basic requirements for supported scaffolds:

- All parts of a scaffold must be plumb and braced.
- All parts, including legs, poles posts, frames and uprights, must be on a firm foundation. The best way to ensure a firm foundation is through the use of base plates and mudsills. Footings have to be level, sound and rigid, and there must be no chance of settling or displacement. Unstable materials or equipment cannot be used anywhere on a scaffold or under its footing. Equipment such as forklifts must not be used to support a scaffold, unless it is designed to be supported this way and the forklift is not moved at all while the scaffold is occupied.
- Anytime a scaffold has a height that is more than four times its width; it has to be restrained with ties and/or braces. These must be installed according to the manufacturer’s recommendations and at the following:
  - Where horizontal members support both inner and outer legs.
  - At the closest horizontal member to the 4:1 height.
  - Every 20 feet vertically or less for scaffolds less than 3 feet wide, or every 26 feet or less for scaffolds wider than three feet. (At each of these heights, the ties and braces must be placed at each end and at intervals of less than 30 feet horizontally.)

## **Access**

This section applies to all employees who have access to scaffolds for reasons other than erecting and dismantling them. Anytime scaffold platforms are more than two feet higher or lower than another level, access must be provided by means of one of the following:

Portable ladders	Stairway-type ladders
Hook-on ladders	Ramps and walkways
Attachable ladders	Integral prefabricated scaffold access
Stair towers	Personnel hoist

Access must not be provided by cross bracing under any circumstances.

Portable, hook-on and attachable ladders must be set up with the bottom rungs no further than 24 inches above the ground (or level), equipped with rest platforms at least every 35 feet and used in such a way that they won't cause the scaffold to tip.

Integral prefabricated scaffold access frames also must have rest platforms every 35 feet. They must be designed specifically to be used as ladders and be spaced uniformly within each frame section. Spacing between rungs cannot be larger than 16¾ inches, and rung length has to be at least 8 inches.

In all cases, rungs and steps need to line up vertically between rest platforms.

## **Access for Erecting and Dismantling Scaffolds**

OSHA requires that a safe means of access must be provided for employees who are erecting or dismantling a scaffold. A competent person will make the determination about how the safe access will be accomplished. Ladders must be installed as soon as it is safe to do so. On fabricated frame scaffolds, also known as tubular welded frame scaffolds, cross bracing should not be used as access, but end frames can be if they are designed to be used as ladders and have horizontal members spaced no more than 22 inches apart

## **Use**

A competent person, before each work shift and after any event that could affect the scaffold's integrity, must inspect scaffolds. Any part of the scaffold that is at all damaged or weakened should be removed, repaired or braced.

Erecting, moving, dismantling or altering can take place only under the supervision of a competent person or trained employees chosen by the competent person.

Clearance between scaffolds and power lines must be calculated. For any power of over 50 kilovolt (kV), the minimum distance is 10 feet. After that, the distance has to be increased by 4 inches for each 10 kV over 50.

Storms and high winds must bring an end to scaffold work unless the competent person determines that it is safe for employees to continue working. In such cases, a windscreen or personal fall-arrest systems must protect employees.

Debris must not be allowed to accumulate on the scaffold.

Employees who need to reach higher than the scaffold allows may not stand on boxes, barrels or other makeshift devices. A ladder can be used if the ladder legs, scaffold planks and scaffold itself is secured against movement. Both ladder legs must be on the same platform plank.

Scaffold platforms may not deflect more than one-sixtieth of the total span at any time. For a 5-foot span, the maximum deflection is 1 inch; on a 10-foot span, it is 2 inches.

## **Fall Protection**

The height trigger for OSHA fall-protection rules on scaffolds is 10 feet. Whenever a scaffold is 10 feet or more above a lower level, a personal fall-arrest system or guardrails is needed.

Guardrail systems must be installed along all open edges and meet certain the following OSHA requirements:

- Capable of supporting a 200-pound force.
- Top-rails must be between 38 and 45 inches above the platform and able to with stand a force of 200 pounds from a downward or horizontal direction.
- When mid rails are used, they should be about halfway between the top-rail and platform level. If screen or mesh is used instead, it must extend all the way from the top rail to the platform. If intermediate members (such as balusters or rails) are used, they must be spaced so there is never more than a 19-inch gap between them. These mid-rail systems must be able to withstand a force of at least 150 pounds.
- Guardrails must be surfaced and constructed for employees' protection. They must be free of any imperfections that could puncture or impale employees' skin or snag their clothing.
- Steel or plastic banding must not be used for top-rails or mid-rails. Manila or plastic rope can be used but only under a competent person's supervision.
- Cross bracing can be used as mid or top-rails, as long as the height is appropriate: Mid-rail cross-braces must be 20 to 30 inches high, and top-rails must be at 38 to 48 inches high. The ends of the cross bracing must not be more than 48 inches apart where they attach to the end-frame.

## **Falling Object Protection**

Fall object protection rules specify that anyone working in an area where an object could fall from above must wear a hard hat. There are also a number of additional ways to protect people from the dangers of falling objects. This potential danger must be considered for employees working on scaffolds, as well as for those below the scaffold.

- Protection from falling objects can be provided by toe-boards, screens, guardrails systems, debris nets, catch platforms or canopies.
- Objects should be kept safely away from the edges of surfaces from which they may fall.
- Barricades below the area will prevent people from walking into an area where they may be struck by a falling.
- Debris nets, catch platforms and canopies must be strong enough to stop any object that may fall into them.
- Toe-boards must be able to withstand a force of 50 pounds, be at least 3½ inches high, and have no more than a ¼-inch clearance from the platform. They must be secured at the outermost edges, and they cannot have any holes larger than 1 inch.

## ***Specific Scaffold Systems***

This section covers additional OSHA requirements for the following scaffold systems: fabricated frame scaffolds, roof brackets, pump jacks, ladder jacks, crawling boards, and mobile scaffolds. All the general information presented previously also applies to these systems. For additional requirements pertaining to suspended scaffolds, refer to 29 CFR 1926.452

### **Fabricated Frame Scaffold**

When moving platforms to the next level, existing platforms must be left in place until the new frames are braced and ready to receive the planks.

All brace connections must be secured and all members must fit together so that the scaffold automatically is squared and aligned.

Frames and panels must be secured by pins.

Brackets that support cantilevered loads must be used appropriately and only to support personnel, unless otherwise designed by a qualified engineer.

Scaffolds more than 125 feet high must be designed by a registered professional engineer.

## **Mobile Scaffolds**

Scaffolds must be securely braced to prevent collapse. They must be plumb, level and squared.

Casters and wheels need to be locked to prevent movement. Caster and wheel stems must be pinned or otherwise secured in the scaffold legs.

When the scaffold is being moved manually, the force must be applied at a height of no more than 5 feet.

When the scaffold is moved by a power system, the system must be specifically designed for this purpose.

Employees on the scaffold must be warned before the scaffold is moved. For it to be moved while employees are on it, the following conditions must exist:

- The ground surface must be within 3 degrees of level and free of pits, holes and obstructions.
- The height-to-base ratio of the scaffold has to be a ratio of 2:1 or less.

If outrigger frames are used, they must be used on both sides of the scaffold.

When power systems are used, the force must be applied directly to the wheels and must not move the scaffold faster than 1 foot per second.

All employees must be on the area of the platform that is within the wheels, casters and supports.

## **Suspended Scaffolds**

For more information about suspended scaffolds, contractors should refer to 29 CFR 1926.451(d) and various parts of 29 CFR 1926.452.

## ***Training***

Employees who perform work while on a scaffold need to be trained in the type of scaffold being used and understand the procedures to control or minimize those hazards. This training should include:

- The nature of any electrical, fall and falling object hazards in the work area,
- The correct procedures for dealing with such hazards and if needed the correct procedures for erecting, maintaining and disassembling the fall protection system and fall object protection systems being used,
- The proper use of the scaffold and the proper handling of materials on the scaffold and
- The maximum intended load and the load-carrying capacities of the scaffold used.

Employees involved in erecting, disassembling, moving, operating, repairing, maintaining or inspecting a scaffold need to be trained to recognize any hazards associated with the work in question. This training should include:

- Nature of scaffold hazards,

- Correct procedures for erecting, disassembling, moving, operating, repairing, maintaining the type of scaffold in question and
- The design criteria, maximum intended load-carrying capacity and intended use of the scaffold.

### ***Retraining***

Retraining shall be provided when the following are noted:

- When there is reason to believe that an affected employee, who has already been trained, does not have the understanding and skill required to work safely,
- When workplace changes present a hazard for which employees have not been trained and
- When scaffold or equipment changes present a hazard for which employees have not been trained.

### ***Certification***

Any employee who works on scaffolds shall receive training by a competent person. Training will address the type of scaffold, hazards that may be encountered and safety controls to minimize those hazards.

All documentation shall bear the names of the employees trained, the date of the training and the name, signature and title of the person who conducted the training.



## **Bloodborne Pathogens Exposure Control**

In the construction, refrigeration industry, we may be exposed to bloodborne pathogens when someone gets cut or injured.

The injured person needs to be attended to by health care personnel. However, you need the following information when you are performing primary assistance.

OSHA's Bloodborne Pathogens Standard 1910-1030 uses the term "universal precautions" as an approach to infection control, specifically relating to blood and other body fluids that have the potential to contain hazardous pathogens. These are the kind of exposures that most commonly occur in general work-place settings.

All employees will have access to a copy of the exposure control plan.

### ***Universal Precautions***

Universal Precautions apply to blood, other body fluids containing visible blood, semen, and vaginal secretions. Universal precautions involve the use of protective barriers such as gloves, aprons, masks, or protective eyewear, which can reduce the risk of exposure. All surfaces that come into contact with blood or other infectious materials will be cleaned and sterilized properly.

Bloodborne pathogens can enter your body through cuts on your hands, eyes, and mouth easily.

Hand washing facilities will be readily available at all work location or antiseptic solutions or towelettes will be available for use.

Treat blood spills with caution; wear personal protective barriers (PPB) when exposed to blood. PPB materials will be provided to employees at no charge.

#### **Personal Protective Barriers (PPB)**

1. Rubber/latex gloves
2. Face shield and glasses
3. Aprons
4. Masks

Dispose of contaminated material and equipment properly in an approved medical disposal area (inquire at the First Aid Center at your location).

1. Wrap contaminated material in place bags before disposal.
2. Wash hand thoroughly with approved hand sanitizer or rubbing alcohol.

#### Medical Records and Vaccinations

1. Hepatitis B Vaccine will be made available to all employees with occupational exposure at no cost to the employee.
2. Medical records for employees will be kept for the duration of the employee plus 30 years.

#### Training

1. Training is to be completed at initial hire and again with 1 year of the previous training.
2. Training shall be documented and kept for no less than 3 years.





## **Fire Protection and Prevention**

Fire protection standards identify the fire prevention regulations that all Gartner Refrigeration and subcontractors must adhere to on all jobsites. This section also discusses the storage of flammables and combustibles.

### ***Fire Prevention Regulations***

#### **General Safety**

1. Housekeeping: Pile materials so that safe clearances are maintained and toppling is prevented. All flammable and combustible materials shall be stored properly. Immediately remove loose overhead material, dispose of garbage, and remove oil and water spillage. Cleanup prevents fires. All subcontractors are responsible for housekeeping in and around their work area at all times.
2. Heaters: Use only safe, U.L. or F.M. approved heaters. These should be in good condition, insulated from the floor and sturdy enough that they won't be knocked over by a careless act. Heaters must be placed well away from flammable materials, vented to the outside or placed in an adequately vented area. Follow manufacturer guidelines.
3. Open flames: including smoking within 25 feet of exposed flammable materials or flammable material storage is prohibited.
4. Flammable Liquids: Store in U.L. approved containers. Shut off all vehicle and equipment engines before fueling. No smoking is permitted in the area. Welding and cutting operations are also prohibited. Do not keep temporary heaters in the area where these liquids are stored.
5. Fire Extinguishers: Provide the required number of extinguishers. Make certain they are the correct type for the hazard and their location is properly marked. (See Extinguisher Selection and Distribution, page 6.) Check and inspect them periodically, at least monthly. Every individual on the job should know both where they are located and how to use them.
6. Welding and Cutting: Keep all fire extinguishing equipment nearby and in a state of readiness. Remove or cover all flammables in the area. Watch where the sparks are going. Check for smoldering sparks or fires both during the operation and about one-half hour later.
7. Obey No Smoking Signs: Proper signage should be posted throughout the jobsite or building.
8. Exits and Exit Signs: Provide at least two means of exit. These must be remote from each other and not able to be blocked at the same time. Erect an extra ladder or two if needed and add additional exit signs.
9. Access: Make certain that a fire lane is kept clear at all times so fire equipment can reach the building. This access must be 12 feet wide to allow for emergency vehicles.
10. What to Do In Case of Fire: Activate the fire alarm on the jobsite if applicable, and call the fire department. Second, evacuate all personnel as quickly as possible. Third, direct the fire department to the fire.

## Extinguisher Selection and Distribution

1. Extinguishers shall be provided for employee use and selected and distributed based on the classes of anticipated jobsite fires and on the size and degree of hazard which would affect their use.
2. Mount, locate and identify extinguishers so they are readily accessible to employees in accordance with the following requirements.
  - At least one size 2A extinguisher for every 3,000 square feet of protected building area.
  - Within 100 feet of any point.
  - On each floor of a multi-story building near each stairway.
  - One size 10B extinguisher within 50 feet of area where more than 5 gallons of flammable liquid is stored.
3. Use only approved extinguishers.
4. Maintain extinguishers in a fully charged and operable condition and keep in their designated places at all times except during use.
5. Perform annual maintenance inspection and attach a tag with date of last inspection and monthly visual inspection.

## Fire Types

**Class A fire.** A fire involving ordinary combustible material such as paper, wood, cloth and some rubber and plastic materials.

**Class B fire.** A fire involving flammable or combustible liquids, flammable gases, greases and similar materials, and some rubber and plastic materials.

**Class C fire.** A fire involving energized electrical equipment where safety to the employee requires the use of electrically nonconductive extinguishing media.

**Class D fire.** A fire involving combustible metals such as magnesium, titanium, zirconium, sodium, lithium and potassium.

**Incipient Stage Fire.** A fire which is in the initial or beginning stage and which can be controlled or extinguished by portable fire extinguishers, Class II standpipe, or small hose systems without the need for protective clothing or breathing apparatus.

## Fire Extinguishers

### Classifications

Portable fire extinguishers are classified to indicate their ability to handle specific classes and sizes of fires. Labels on extinguishers indicate the class and the numerical ratings indicates the relative size of fire that an experienced person can be expected to handle.

Extinguisher Class	Type of Fire	Numerical Rating
Class A	Ordinary combustibles, such as wood, cloth and paper	1-A, 2-A, 3-A, 4-A, 6-A, 10-A, 20-A, 30-A, 40-A
Class B	Liquids, greases and gases	1-B, 2-B, 5-B, 10-B, 20-B, 30-B, 40-B Up to 640-B
Class C	Energized electrical	Tested only for

	equipment	electrical conductivity. No extinguisher receives a Class C rating without a Class B rating
Class D	Metals such as magnesium, titanium, zirconium, sodium, potassium	Tested only for metal fires. Agent used depends on the metal for which the extinguisher is designed. Check the extinguisher faceplate for effectiveness on specific metals

The recommended marking system to indicate the extinguisher suitability according to class of fire is a pictorial concept that combines the uses and non-uses of extinguishers on a single label.

Portable fire extinguishers are classified to indicate their ability to handle specific classes and sizes of fires. Labels on extinguishers indicate the class and relative size of fire that they can be expected to handle.

**Class A** extinguishers are used on fires involving ordinary combustibles, such as wood, cloth, and paper.

**Class B** extinguishers are used on fires involving liquids, greases, and gases.

**Class C** extinguishers are used on fires involving energized electrical equipment.

**Class D** extinguishers are used on fires involving metals such as magnesium, titanium, zirconium, sodium, and potassium.



The recommended marking system to indicate the extinguisher suitability according to class of fire is a pictorial concept that combines the uses and non-uses of extinguishers on a single label. This system is illustrated in the accompanying figure. The first set (row) of symbols illustrated in the figure is a label for use on a Class A extinguisher. The symbol at the left (which depicts a Class A fire) is blue. Since the extinguisher is not recommended for use on Class B or C fires, the remaining two symbols (which depict Class B and Class C fires) are black, with a diagonal red line through them. The second set (row) of symbols illustrated in the figure is a label for use on a Class AIB extinguisher. The two left symbols are blue. Since the extinguisher is not recommended for use on

Class C fires, the symbol on the far right (which depicts a Class C fire) is black, with a diagonal red line through it. The third set of symbols is a label for use on Class B/C extinguishers. The two right symbols are blue. Since the extinguisher is not recommended for use on Class A fires, this symbol is black, with a diagonal red line through it. The fourth set of symbols is a label for use on Class A/B/C extinguishers. All symbols on this label are blue.



## Extinguisher Suitability

Letter shaped symbol marking are also used to indicate extinguisher suitability according to the class of fire. Extinguishers suitable for more than one class of fire should be identified by multiple symbols placed in a horizontal sequence. Letter-shaped symbol markings are also used to indicate extinguisher suitability according to class of fire.

Extinguishers suitable for Class A fires should be identified by a triangle containing the letter "A." If colored, the triangle should be green.

Extinguishers suitable for Class B fires should be identified by a square containing the letter "B." If colored, the square shall be colored red.

Extinguishers suitable for Class C fires should be identified by a circle containing the letter "C." If colored, the circle should be colored blue.

Extinguishers suitable for fires involving metals should be identified by a five-pointed star containing the letter "D." If colored, the star shall be colored yellow.

Extinguishers suitable for more than one class of fire should be identified by multiple symbols placed in a horizontal sequence.

Class A and Class B extinguishers carry a numerical rating to indicate how large a fire an experienced person can put out with the extinguisher. The ratings are based on reproducible physical tests conducted by Underwriters' Laboratories, Inc. Class C extinguishers have only a letter rating because there is no readily measurable quantity for Class C fires which are essentially Class A or 8 fires involving energized electrical equipment. Class D extinguishers likewise do not have a numerical rating. Their effectiveness is described on the faceplate.

Class A	Fires involving the combustion of ordinary materials such as wood, cloth, paper, plastics etc. The extinguishers contain pressurized water or water based extinguishing agents.
Class B	Fires involving combustible or flammable liquids such as gasoline, kerosene and many chemical agents including gases. Extinguishers

	contain carbon dioxide or a dry chemical extinguishing agents. When extinguishing electrical fires in or around sensitive equipment such as computers, a carbon dioxide extinguisher is preferred, as it does not leave any residue that will harm subsequent operation of the equipment.
Class C	Fires involving energized electrical equipment such as appliances of all kinds, motors, computers. Etc. Extinguishers contain carbon dioxide, Halon, dry chemical or liquid extinguishing agent.
Class D	Fires involving combustible metals such as sodium, lithium, titanium, magnesium. Extinguishing agent usually comes in dry powder form stored in a bucket.
Extinguisher Type	Type of Fire

## Water - Air-Pressurized Water Extinguishers (APW)



Water is one of the most commonly used extinguishing agents for type A fires. You can recognize an APW by its large silver container. They are filled about two-thirds of the way with ordinary water, then pressurized with air. In some cases, detergents are added to the water to produce a foam. They stand about two to three feet tall and weigh approximately 25 pounds when full.

APWs extinguish fire by cooling the surface of the fuel to remove the "heat" element of the fire triangle.

APWs are designed for Class A (wood, paper, cloth, rubber, and certain plastics) fires only.



### Important:

- Never use water to extinguish flammable liquid fires. Water is extremely ineffective at extinguishing this type of fire and may make matters worse by the spreading the fire.
- Never use water to extinguish an electrical fire. Water is a good conductor and may lead to electrocution if used to extinguish an electrical fire. Electrical equipment must be unplugged and/or de-energized before using a water extinguisher on an electrical fire.

## CO<sub>2</sub> or Dry Chemical – Carbon Dioxide Extinguishers



This type of extinguisher is filled with Carbon Dioxide (CO<sub>2</sub>), a non-flammable gas under extreme pressure. These extinguishers put out fires by displacing oxygen, or taking away the oxygen element of the fire triangle. Because of its high pressure, when you use this extinguisher pieces of dry ice shoot from the horn, which also has a cooling effect on the fire.

You can recognize this type of extinguisher by its hard horn and absent pressure gauge. CO<sub>2</sub> cylinders are red and range in size from five to 100 pounds or larger. CO<sub>2</sub> extinguishers are designed for Class B and C (flammable liquid and electrical) fires only.



### Important:

- CO<sub>2</sub> is not recommended for Class A fires because they may continue to smolder and re-ignite after the CO<sub>2</sub> dissipates.
- Never use CO<sub>2</sub> extinguishers in a confined space while people are present without proper respiratory protection.

### Locations:

Carbon dioxide extinguishers will frequently be found in industrial vehicles, mechanical rooms, offices, computer labs, and flammable liquid storage areas.

## Multi-Purpose – Dry Chemical Extinguishers



Dry chemical extinguishers put out fires by coating the fuel with a thin layer of fire retardant powder, separating the fuel from the oxygen. The powder also works to interrupt the chemical reaction, which makes these extinguishers extremely effective.

Dry chemical extinguishers are usually rated for class B and C fires and may be marked multiple purpose for use in A, B, and C fires. They contain an extinguishing agent and use a compressed, non-flammable gas as a propellant.

ABC fire extinguishers are red in color, and range in size from five pounds to 20 pounds.



**Dry Chemical extinguishers will have a label indicating they may be used on class A, B, and/or C fires.**



## Locations:

These extinguishers will be found in a variety of locations including: public hallways, laboratories, mechanical rooms, break rooms, chemical storage areas, offices, commercial vehicles, and other areas with flammable liquids.

The ratings for Class "A" or "B" portable extinguishers are also accompanied by a numerical value which corresponds its extinguishing capacity.

## CLASS A

Fire extinguishers with a Class "A" ratings are effective against fires involving paper, wood, textiles, and plastics. The primary chemical used to fight these fires is monoammonium phosphate, because of its ability to smother fires in these types of materials.



To achieve the Class A rating, an extinguisher must be capable of extinguishing the wood crib, wood panel, and \*excelsior fire tests. Ratings are based on the size of the crib, panel, and excelsior fires that are repeatedly extinguished. The following dimensions are approximate sizes, supplied for informational purposes only.

Rating	Wood Crib (Inches)	Wood Panel (Feet)	Excelsior (Pounds)
1-A	20x20x20	8x8	6
2-A	25x26x26	10x10	12
3-A	30x30x30	12x12	18
4-A	33x30x30	14x14	24
6-A	38x38x38	17x17	36
10-A	48x38x38	17x17	36

Excelsior fine curled wood shavings used especially for packing fragile items.

## CLASS B

Fire extinguishers with a Class "B" ratings are effective against flammable liquid fires. These can be fires where cooking liquids, grease, oil, gasoline, kerosene, or paint have become ignited. Two commonly used chemicals are effective in fighting these types of fires. Monoammonium phosphate effectively smothers the fire, while sodium bicarbonate induces a chemical reaction which extinguishes the fire.



To achieve the Class B rating, an extinguisher must repeatedly put out a flaming liquid fire. The rating is again based on the size of the fire extinguisher.

Rating	Pan Size (Sq. Ft.)	Gallons of Heptane
1-B	2.5	3.25
2-B	5.0	6.25

5-B	12.5	15.5
10-B	25	31.0
20-B	50.0	65.0
30-B	75.0	95.0
40-B	100.0	125.0

### **Class C**

Fire extinguishers with a Class C rating are suitable for fires in “live” electrical equipment. Both monoammonium phosphate and sodium bicarbonate are commonly used to fight this type of fire because of their non-conductive properties.



To achieve the Class C rating, an extinguisher and contents must pass certain Electrical Conductivity measurements in accordance with UL 711 and UL 299.

All extinguisher ratings are shown on the extinguisher faceplate. Each extinguisher is rated with a letter (A, B, C, D or K) corresponding to the type of fire that it can be used on (See table above).

### ***How to Choose a Fire Extinguisher***

Some extinguishers are rated to be used on more than one type of fire. These combinations are AB, AC, BC and ABC, which can be used on those types of fires corresponding to their rating letters as defined above. The combination extinguishers usually contain dry or wet chemical extinguishing agents, water, or carbon dioxide.

Class C extinguishers do not have a numerical rating, as the fires that they are used for usually are made up of both Class A and B fires, thus requiring them to also carry an A or B rating. Class C only refers to the fact that the extinguishing medium is non-conducting and can be used on electrical fires in which the equipment is energized.

Class D extinguishers usually are specific to the metal that would potentially ignite. It only carries the letter rating to indicate the type of fire it is to be used on.

If you have any questions regarding the type of extinguisher that is required in your office, or work area, please feel free to contact us.

### ***What Each Type of Fire Extinguisher Looks Like***

Generally, you can tell with a glance which type of extinguisher is hanging on the wall, or in the cabinet, just by looking at its shape. Check the labels of the extinguishers in your area and note the color and shape/size of the extinguisher. This may help if someone assists you in fighting a fire with the **WRONG** extinguisher (i.e. water on an electrical fire) -you can **STOP** them before they are injured or make matters worse!

ABC-rated multipurpose dry powder extinguishers are the most common on campus, particularly in the corridors of academic buildings. They are almost always **RED** in color and have either a long narrow hose or no hose (just a short nozzle). These extinguishers are very light (5-25 lbs total weight).

Water extinguishers are usually **SILVER** (chrome-metal) in color, have a flat bottom, have a long narrow hose, and are quite large (2-1/2 gallons).



CO<sub>2</sub> (carbon dioxide) extinguishers are generally red (often yellow around aircraft or on military sites), have a LARGE "tapered" nozzle (horn), are VERY HEAVY (5-100 lbs. hand held or wheeled units). CO<sub>2</sub> Extinguishers are all high-pressure cylinders.

Care should be used not to drop a CO<sub>2</sub> cylinder; if it is damaged pressure released can punch a hole through the nearest wall(s) and end up on the other side of the building! (The containers are quite sturdy, but don't abuse them.)

Note: CO<sub>2</sub> extinguishers do not have pressure gauges and must be weighed to determine the exact amount of extinguishing agent inside.

## ***Flammable and Combustible Liquids Storage***

### **Indoor Storage**

1. No more the 25 gallons of flammable or combustible liquids shall be stored in a room outside of an approved storage cabinet.
2. Quantities of flammable and combustible liquid in excess of 25 gallons shall be stored in an acceptable or approved cabinet.
  - Cabinets shall be labeled in conspicuous lettering: "FLAMMABLE- KEEP FIRE AWAY"
  - Not more than 60 gallons of flammable or 120 gallons of combustible liquids shall be stored in any one storage cabinet.
  - Not more than three such cabinets may be located in a single storage area.

### **Outdoor Storage**

1. Storage of containers (not more than 60 gallons each) shall not exceed 1,100 gallons in any one pile or area.
2. Within 200 feet of each pile of containers, there shall be a 12- foot wide access way to permit approach of fire control apparatus.
3. The storage area shall be graded in a manner to divert possible spills away from buildings or other exposures, or shall be surrounded by a curb or earth dike at least 12 inches high. When curbs or dikes are used, provisions shall be made for draining off accumulations of ground or rain water, or spills of flammable or combustible liquids. Drains shall terminate at a safe location and shall be accessible to operation under fire conditions.
4. Outdoor portable tanks shall not be nearer than 20 feet from any building.
5. Portable tanks, not exceeding 660 gallons, shall be provided with emergency venting and other devices, as required by Chapters III and IV of NFPA 30-1969. The Flammable and Combustible Liquids Code.

### **Fire Control**

1. At least one portable fire extinguisher, having a rating of not less than 20-B units, shall be located outside of, but not more than 10 feet from, the door opening into any room used for storage of more than 60 gallons of flammable or combustible liquids.
2. At least one portable fire extinguisher having a rating of not less than 20-B units shall be located not less than 25 feet, nor more than 75 feet, from any flammable liquid storage area located outside.

## **Dispensing Liquids**

1. Areas in which flammable or combustible liquids are transferred at one time, in quantities greater than 5 gallons from one tank or container to another tank or container shall be separated from other operation by 25 feet distance or by construction having a fire resistance of at least 1 hour. Draining or other means shall be provided to control spills.

## **Training**

1. All employees will receive training for job specific hazards prior to job commencement. They will also receive fire extinguisher training annually. Records will be kept for employees who have received training.



## Hand and Portable Power Tools

### Scope

This section summarizes that basic safety rules we must practice when operation different types of tools so as to avoid the potential power tools present.

### General Safety Precautions

1. Gartner Refrigeration employees working on jobsite must be trained in the use of tools or equipment needed to perform their job. They should understand the potential hazards as well as the safety precautions required to prevent those hazards from occurring.
2. Personal Protective Equipment, safety glasses, gloves, steel toe boots. Should be worn due to hazards that may be encountered while using portable power tools and hand tools. Approved safety glasses meeting ANSI Z87.1 with attached side shields are to be worn during all work activities on Gartner Refrigeration jobsites.
3. Floors shall be kept as clean and dry as possible to prevent accidental slips with or around dangerous hand and portable power tools
4. Around flammable substance, sparks produced by steel hand tools can be a dangerous ignition source.

### Hand Tools

#### Definition

Hand tools are non-powered. They include anything from wrenches. The greatest hazards posed by hand tools result from misuse and improper maintenance.

Hazard	Citation	Example
Employer shall not issue of permit the use of unsafe hand tools.	1926.301(a)	Using a chisel as a screwdriver may cause the tip of the chisel to break off, hitting the user or others.
Wrenches, including adjustable, pipe and socket, shall not be used when jaws are sprung to the point that slippage occurs.	1926.301(b)	A wrench might slip if its jaws are sprung.
Impact tools, such as drift pins, wedges, and chisels, shall be kept free of mushroomed heads	1926.301(b)	Mushroomed heads could shatter on impact, sending sharp fragments flying.
The wooden handles of tools shall be kept free of splinters or cracks and	1926.301(d)	If a wooden handle on a tool, such as a hammer, is loose, splintered, or cracked, the head of the tool

shall be kept tight in the tool.		may fly off and strike the user or others.
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## ***Power Tools***

### **Potential Hazards**

Power tools can be hazardous when improperly used. The following precautions should be observed by power tools users.

1. Never carry a tool by the cord or hose. 1923.302(a) 1923.302(b)(6)
2. Never yank the cord or the hose to disconnect it from the receptacle.
3. Keep cords and hoses away from heat, oil and sharp edges.
4. Disconnect tools when not in use, before servicing, and when changing accessories such as blades, bits and cutters.
5. Keep all observers at a safe distance away from the work area.
6. Secure work with clamps or vise, freeing both hands to operate the tool.
7. Avoid accidental starting. The worker should not hold a finger on the switch button while carrying an energized tool.
8. Maintain tools with care. They should be kept sharp and clean for the best performance. Follow instructions in the user's manual for lubricating and changing accessories.
9. Wear the correct PPE. No loose clothing, ties, or jewelry they can get caught be the moving parts. Be sure to keep good footing and maintain good balance.
10. Remove any damage portable electric tools from use. Tag them with "DEFECTIVE TOOL" or "DO NOT USE" and return them for repair

### **Guards**

Hazardous moving parts of a power tool need to be safeguarded. For example, grinders, any type of cutting saws or any other rotating or moving parts of equipment must be guarded if such parts are exposed to contact employees. 1926.300(b) (1) Safety guard must never be removed when a tool is being used. For example, portable circular saws must be equipped with guards. An upper guard must cover the entire blade of the saw. A retractable lower guard must cover the teeth of the saw, except when it makes contact with work material. The lower guard must automatically return to the covering position when the tool is withdrawn from the work.

### **Safety Switches**

All hand-held powered grinders with wheels 2-inch diameter or less, jigsaws with blade shanks one fourth of an inch wide or less may be equipped with only a positive "on-off" control.

All hand-held powered drills, fastener drivers, horizontal, vertical and angle grinders with wheel greater than 2 inches in diameter or any other similar operating powered tools shall be equipped with a monetary contact "on-off" control may have a lock-on control provided that turnoff can be accomplished by single motion of the finger or fingers that turn it on.

### **Electric Tool**

Any worker using electric tools must be aware of several dangers; the most serious is the possibility of electrocution. Among the hazards of electrical power tools are burns and electrical shocks that can lead to injuries or even heart failure. Under certain conditions, even a

small amount of current can result in fibrillation of the heart and eventual death. A shock also can cause the user to fall off a ladder or other elevated work surface.

Tools must have a three-wire cord with ground and be grounded, be double insulated. Three-wire cords contain two current carrying conductors and a grounding conductor. One end of the grounding conductor connects to the tool's metal housing. The other end is grounded through a prong on the plug. Anytime an adapter is used to accommodate a two-hole receptacle, the adapter wire must be attached to known ground. **THE THIRD PRONG SHOULD NEVER BE REMOVED FROM THE PLUGS.**

Double insulated protects the user and the tools in two ways:

1. Normal insulation on the wires inside
2. Housing that cannot conduct electricity to the operator in the event of malfunction

### **Safety Precautions**

1. Operate electric tools within their design limitation
2. Wear gloves and safety glasses include face shields for any type of cutting, safety footwear when using electric tools
3. Store tools in a dry place when not in use.
4. Do not use electric tools in damp or wet locations.
5. Keep work areas well lighted.

### **Pneumatic Tools**

Pneumatic tools are powered by compressed air.

There are several dangers encountered in the use of pneumatic tools. The main one is the danger of getting hit by one of the tool's attachments or by some kind of fastener the workers in using with the tool.

Safety Precautions:

1. All pneumatic tools which shoot nails, rivets, or staples and that operate at pressures more than 100 pounds per square inch shall have a device to keep
2. Fasteners from being ejected unless the muzzle is pressed against the work surface.  
1926.302(b)(3)
3. Use proper eye protection when using pneumatic tools; it is required. Full facial protection is recommended for employees working with pneumatic tools, in form of a faceshield.
4. Use proper hearing protection
5. Regularly inspect pneumatic tools.

### **Liquid Fuel-Powered Tools**

Liquid fuel-powered tools usually use gasoline. The most hazards with fuel-powered tools come from fuel vapors that can burn or explode and give off dangerous exhaust emissions.  
1926.30 (c)(2)

Fuels must be stored in approved flammable liquid containers and in accordance with proper procedures for flammable liquids.

### Safety Precautions:

1. Before refueling tools, shut down the engine and allow it to cool in order to prevent accidental ignition of hazardous vapors. 1926.302(c)(1)
2. If a fuel-powered tool is used inside a closed area, provide effective ventilation and/or personal protective equipment so as to avoid harmful concentrations of exhaust gases. 1926.302(c)(2)
3. Keep fire extinguishers readily at hand in the area.

## **Powered Abrasive Wheel Tools**

Powered abrasive grinding, cutting, polishing, and wire buffing wheels create special safety problems because they may throw off flying fragments.

### Safety Precautions:

1. Before an abrasive wheel is mounted, inspect it carefully. Sound-or ring- test it to be sure it is free from cracks or defects. To test wheels should be tapped gently with a light non-metallic instrument. A sound and undamaged wheel will give a clear metallic tone or "ring". 1926.303(c)(7).
2. To prevent the wheel from cracking, be sure it fits freely on the spindle. The spindle nut must be tightened enough to hold the wheel in place, without distorting the flange.
3. All portable grinding tools shall have guards to protect workers not only from the moving wheel surface but also from flying fragments in case of breakage. 1926.303(c)(5).
4. Always use eye protection. Full facial protection is recommended 1926.303(c)(9).
5. Always turn the power off when not in use.
6. Never clamp a hand-held grinder in a vise.



## **Ladders and Stairways**

### ***Scope***

This procedure is to insure proper use and minimum requirements for ladders and stairways for all Gartner Refrigeration employees and subcontractors.

### ***Training Requirements***

All Gartner Refrigeration employees on jobsites must be trained on safe use of ladders and stairways.

### ***Ladders***

#### **Construction Requirements**

1. All ladders shall be constructed of wood, metal, or other equivalent material and shall have a safety factor of not less than four times maximum intended load. Each step or rung shall be capable of supporting a single concentrated load of at least 250 pounds.
2. Rungs, cleats, and steps of portable metal ladders shall be corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize slipping.

#### **Safety Guidelines**

1. Non-conductive, type I, portable, fiberglass ladders are recommended for use on Gartner Refrigeration jobsites.
2. Use only the proper type of ladder, matched to the job or task, according to manufacturer's instructions.
3. Make sure hands, shoes, and ladder rungs are free of oil, grease or other material before climbing.
4. All ladders must be regularly inspected by a competent person to ensure their safe working condition.
5. Ladders placed in any location where they can be displaced by workplace activities or traffic, such as in passageways, doorways, or driveways shall be secured to prevent accidental displacement or a barricade shall be used to keep the activities or traffic away from the ladder.
6. Do not leave ladders unattended unless properly secured.
7. Tie-off and secure ladders to prevent slippage for proper access.
8. A ladder must extend 3 feet above the upper level when used for access to an upper elevation. 1926.1053(b)(1)
9. Never use a metal ladder when doing electrical work.
10. Never use ladders in horizontal position as platforms, walkways, or scaffolds.

11. Always face the ladder when climbing, maintaining a 3-points contact with the ladder.
12. Do not overreach while on the ladder. Move the ladder to correct position before climbing.
13. Ladders shall be used at an angle such that the horizontal distance from the top support to the foot of the ladder is approximately one-quarter, or 4:1 of the working length of the ladder.
14. Fall protection may be required for certain types of work for extended periods while working from a ladder. Ladder use in areas exposed to dangerous falls, building edges, open stairways, call for fall protection of adjusting the work.
15. Defective ladders are to be tagged and taken out of service.

### ***Stepladders***

1. The standard stepladder, a general purpose ladder has flat steps and a hinged back. It is self-supporting and nonadjustable. An industrial model, designed for heavy service demands, had oversize back legs, heavy-duty flat steps, and knee braces that increase rigidity and durability.
2. Stepladders shall not exceed 20' in height.
3. The top or top step of a stepladder shall not be used as a step. See specific manufacturers label warnings.
4. Stepladders must be set level on all four feet, with spreaders fully extended and locked into place.
5. Tie-off stepladders when used close to edges of different levels, in high traffic areas, or when the type of work and location could cause the ladder to become unstable.
6. Cross-bracing on the rear section of a stepladder shall not be used for climbing unless the ladder is designed and provided with steps for climbing on both front and rear sections.

### ***Portable Ladders***

1. Portable ladders used for access to an upper landing surface must have side rails that extend at least 3' about the upper landing surface to which the ladder is used to gain access.
2. There are many different types of portable ladders but they all receive one of four ratings, based on the maximum weight they can safely support. Refer to the manufacturer specifications.
3. The top or top step of a stepladder shall not be used as a step.
4. Single portable ladders must not be longer than 30 feet and are intended for use by only one worker at a time. Such ladders come in wood, metal and reinforced fiberglass versions.
5. Stepladders must be set level on all four feet, with spreaders fully extended and locked into place.
6. Tie-off stepladders when used close to edges of different levels, in high traffic areas, or when the type of work and location could cause the ladder to become unstable.
7. Cross-bracing on the rear section of a stepladder shall not be used for climbing unless the ladder is designed and provided with steps for climbing on both front and rear sections.

### ***Extension Ladders***

1. Extension ladders are made of wood, metal, or reinforced fiberglass.



2. Wood ladders can't have more than two sections and must not exceed 48 feet. Metal and fiberglass ladders can have as many as three sections; however, the overall length must not exceed 60 feet. Individual sections of any extension ladder must not be longer than 30 feet.
3. Extension ladders are for use by only one person at a time.
4. Extension ladders must be tied off at the top, if possible, or blocked or held at the bottom. Have someone hold the bottom or top of the ladder until it can be tied off.
5. Extension ladders offer the greatest length in a general purpose ladder. The ladder consists of two or more sections that travel in guides or brackets, allowing adjustable lengths. The sections must be assembled so that the sliding upper section is on top of the lower section. Each section must overlap its adjacent section a minimum distance, based on the ladder's overall length. The overall length is determined by the lengths of the individual sections, measured along the side rails. The table below shows the minimum overlap for ladders up to 60 feet long.

Rating Load	Working
Up to and including 36 feet	3 feet
Over 36 through 48 feet	4 feet
Over 48 through 60 feet	5 feet

6. Ladders should be placed using the 4:1 rule –the base of the ladder set one foot out from the supporting structure for every 4 feet of working height. (Example: A ladder extending 20 feet should be set 5 feet from the wall.)

## ***Storing and Care of Ladders***

1. The ladder storage area should be well ventilated.
2. Wood ladders shouldn't be exposed to moisture or excessive heat. Avoid storing ladder near stoves, steam pipes, or radiators.
3. Store straight or extension ladders in flat racks or on wall brackets. Make sure there are enough brackets to support the ladder so that it doesn't sag. If the ladder rails have a lateral curve, the wall brackets should match the curve.
4. Store stepladders and tripod ladders vertically, in closed position, to reduce the risk of sagging or twisting. Secure stored ladders so that they won't tip over if they are stuck.
5. Store ladders, especially wood ladders, promptly after using them. Exposure to moisture and sun will shorten the life of a wood ladder.

## ***Stairways***

### **Construction Requirements**

1. Stairways that will not be a permanent part of the structure on which construction work is being performed shall have landings of not less than 30 inches (76 cm) in the direction of travel and extend at least 22 inches (56 cm) in width at every 12 feet (3.7 m) or less of vertical rise. 1926.1052(a)(1)

2. Riser height and tread depth shall be uniform within each flight of stairs, including any foundation structure used as one or more treads of the stairs. Variation in riser height or tread depth shall not be over inch (0.6 em) in any stairway system. 1926.1052(a)(3)
3. Where doors or gates open directly on a stairway, a platform shall be provided, and the swing of the door shall not reduce the effective width of the platform to less than 20 inches (51 em). 1926.1052(a)(5)
4. Stairways under construction with potential fall hazards shall be barricaded and only authorized employees shall be allowed to work on them with proper fall protection. 1926.1052

### **Safety Guidelines**

1. Slippery conditions on stairways shall be eliminated before the stairways are used to reach other levels. 1926.1052(a)(6).



## **Process Safety Management – Contractor Responsibilities**

### ***Purpose***

The purpose of Process Safety Management (PSM) is to prevent or minimize consequences of catastrophic releases of toxic, reactive, flammable or explosive chemicals in various industries such as refineries and industrial refrigeration. The requirements of a Process Safety Management Program are outlined in 29 CFR 1910.119. Gartner Refrigeration employees will perform work at the job sites that are covered by this standard. Therefore, the purpose of this written program is to ensure our employees are trained in the practices necessary to conduct their work at PSM covered work sites and to ensure they abide by the safe work practices of the employers that hire us to perform various jobs.

### ***General***

Contractors under the Process safety Management program are those who are involved in the installation or maintenance of equipment and systems at a facility that has one of the following:

- (i) A process which involves a chemical at or above the specified threshold quantities listed in Appendix A to this section.
- (ii) A process which involves a flammable liquid or gas (as defined in 1910.1200) on site in one location, in a quantity of 10,000 pounds (4535.9 kg) or more except for:
  - a. Hydrocarbon fuels used solely for workplace consumption as a fuel (e.g., propane used for comfort heating, gasoline for vehicle refueling), if such fuels are not part of a process containing another highly hazardous chemical covered by this standard;
  - b. Flammable liquids stored in atmospheric tanks or transferred which are kept below their normal boiling point without benefit of chilling or refrigeration.

As contractors covered under the PSM Program, we will be provided necessary information concerning the hazardous process, equipment, and procedures of the particular job site our employees are working at.

### ***Specific Requirements***

#### **Pre-Work Review**

Prior to allowing Gartner Refrigeration employees to commence work in a process covered under PSM, the following requirements must be completed by the PSM Company we will be doing work for:

- Obtain and evaluate the information regarding Gartner Refrigeration's safety performance and programs (written documentation required).
- Inform Gartner Refrigeration Site Foremen or other designated Gartner Refrigeration employee of the known potential fire, explosion, or toxic release hazards related to the work area and processes of the Company.
- Explain the applicable provisions of the emergency action plan to Gartner Refrigeration employees.
- Provide the Site Forman with copies of local safety programs, safety and emergency procedures and a copy of the PSM program.
- Complete all the requirements of the Company's Contractor Liability Agreement.
- Inform Gartner Refrigeration that a periodic performance evaluation will be conducted to ensure our employees are fulfilling our obligations.
- Inform Gartner Refrigeration that a contract employee injury and illness log related to our work in process areas must be maintained on site for the duration of the contract work.

Gartner Refrigeration will provide information to the Contractor Employer relating to any unique hazards presented by our employee's work or any hazards found by our employees.

### ***Training***

Prior to the start of any work at a facility covered under PSM standard, Gartner Refrigeration will assure that each employee is trained in the work practices necessary to safely perform his or her job. Gartner Refrigeration will provide the following documentation to each PSM covered facility that we will be performing work at:

- Our safety program information and other documentation required by the Company's Contractor Liability and Safety Agreement.
- Certification that we have informed our employees of potential fire, explosion, or toxic release hazards that may exist at or near their work area at the facility, and that we have explained the Company's Emergency Action Plan to our employees. Material Safety Data Sheets will be used to discuss process safety information for the particular site we will be working at.
- Training documentation concerning training provided to our employees to ensure they understand the safe work practices necessary to safely perform tasks.
- Certification that we have explained the Hot Works Permit Program for the Company we are working for and other permits the Company uses that will be needed during their time on Company property.
- Agreement to advise the Company we are working for of any unique hazards presented by our work and found during our work.
- Certification that materials, parts and equipment to be installed meet industry and engineering standards for the application used.

Gartner Refrigeration will assure that our employees have been instructed in known potential fire, explosion, or toxic release hazards related to his/her job. The Site Foreman will be responsible for ensuring that each employee has received and understood the required training. Training will be documented and will consist of the employee's name, the date of training, and the means used to verify that the employee understood the training.

### ***Safe Work Practices***

Gartner Refrigeration employees will be required to abide by PSM employer's safety work practices during operations such as lockout/tagout, confined space entry, opening process equipment or piping, and controls over entrance to the facility. Safe work practices will be covered during site-specific training. Training will be documented.

### ***Hot Work***

Before cutting or welding is permitted at a work site, the area must be inspected by the individual responsible for authorizing cutting and welding operation at the Company we are performing work for. Gartner Refrigeration employees will not be allowed to perform hot work until a hot work permit is obtained from the employer's designated representative. The permit shall document that provisions of CFR 1910.252 (a) have been met. See the Hot Work written program for more information about safe work practices.

### ***Incident Investigations***

Employees must immediately report all accidents, injuries and near misses to their Site Foreman, who will then notify the correct Company individuals. An incident investigation must be initiated within 48 hours. Resolutions and corrective actions must be documented and maintained for five years.

### ***Trade Secrets***

Gartner Refrigeration employees must respect the confidentiality of trade secret information when any Process Safety Information is released to them.



## **Subcontractor Management Plan**

### ***General Requirements***

Each subcontractor must complete the Gartner Subcontractor Qualification Questionnaire in order to bid any project for Gartner Refrigeration. In addition, the subcontractor must qualify in order to receive a project or bid on future projects. The Subcontractor Qualification Questionnaire will contain the following information.

- Company name, address, phone number and fax number
- Website, Federal ID# and D&B#
- Company contact with phone number and e-mail
- Type of company
- List of jurisdiction and trade categories in which the organization is legally qualified to do business and indicate registration or license numbers.
- Annual sales volume for the last 3 years
- List of the largest projects in the last 2 years
- Current back log of jobs
- Completed W9
- Legal
  - Has the company ever failed to complete a job
  - Are there any judgments on the company
  - Are there any lawsuits pending in regards to construction contracts?
  - Have they every filed for bankruptcy
- Safety Programs
  - Any OSHA fines in the last 3 years
  - Any jobsite fatalities within the last 5 years
  - EMP rating for last 3 years (explanation if over 1.0)
  - Company has to agree to the Gartner Refrigeration Safety Policy regulations
- Submit copy of Certificate of Insurance naming Gartner Refrigeration as an additional insured with minimum requirements

Companies that complete and qualify to work as a subcontractor for Gartner Refrigeration will be required to complete the following items when on site.

- Before the start of work, Gartner Refrigeration and the subcontractor will discuss and establish who will communicate the roles and responsibilities for the work that is going to be completed.
- Subcontractors will follow all of Gartner Refrigeration or the customers safety policies depending which are more stringent
- Subcontractors will participate in job safety orientations, pre-job meetings and kick –off meetings
- Subcontractors will participate in or complete their own tailgate safety meetings, job safety analysis or hazard assessments, and on the job safety inspections

- An emergency action plan will be established that the subcontractor will follow.
- Subcontractors will participate in a post-job safety performance review of the job



## **Rigging Safety**

### ***Purpose***

This procedure provides the guidelines for the proper rigging and lifting activities are accomplished safely and in accordance with applicable specifications, codes, and regulations.

### ***Scope***

This procedure applies to all personnel and subcontractors working on projects where rigging and lifting safety requirements are applicable.

### **References**

- Title 29, Code of Federal Regulations, Parts 1910 and 1926, *Occupational Safety and Health Administration* (OSHA), U.S. Department of Labor.
- ANSI B-30 Series Standards, Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings.
- ISO 15513 Cranes – Competency Requirements for Crane Operators, Slings

### **General**

- Lifts that exceed 85% of the cranes manufacturers rated capacity are prohibited.
- Mats shall be used on all lifting equipment, equipped with outriggers.
- Outriggers shall be used on all lifts over the side or whenever scoping out with a load on the hook.
- Pick and carry shall have the load secured to the rig in front.
- These work practices are not intended to take the place of common sense or good judgment.

### **Definitions**

None

### ***Procedure***

#### **Rigging Practices**

1. Use loops, thimbles and corner pads to prevent damage to slings when used around corners or on cutting edges.
2. Never allow wire rope to lie on the ground for any length of time or on rusty steel or near solvents, chemicals or corrosive substances.
3. Slings shall not be pulled from between or under loads with load resting on the sling.
4. Keep all rope away from flame cutting or welding operations.
5. Never use rope as sling material.
6. Never wrap a wire rope completely around a hook.



7. Do not bend wire rope near any attached fitting.
8. The sling must be selected to suite the most heavily loaded leg rather than the total weight when using multi-legged sling to lift loads in which one end is heavier than the other.
9. When using 3 and 4 legged sling configurations, any two legs must be capable of supporting the entire load.
10. Where possible, wire rope choker hitches should include a shackle with the eye around the shackle pin to prevent breaking wires of the choke. The choker hitch should be “snugged down” prior to lifting, not after tension is applied.
11. Unless authorized by the hook manufacturer when more than two rope eyes are placed over a hook, install a shackle, pin resting in the hook, and place the rope eyes in the bowl of the shackle.
12. Properly rig all loads to prevent dislodgment of any part.
13. Use guide ropes or tag lines to prevent the rotation or uncontrolled motion of the load when necessary.
14. Loads must be safely landed and properly blocked before being unhooked and unslung. Tag lines shall not be used in situations that jeopardize the safety of the lift.
15. Lifting beams should be plainly marked with their weight and designed working load and should only be used in the manner for which they were designed.
16. The hoist rope or chain shall never be wrapped around the load. The load shall be attached to the hook by slings or other rigging devices that are adequate for the load being lifted.
17. Multiple part lines shall not be twisted around each other.
18. The hook should be brought over the center of gravity of load before the lift is started.
19. Latches will be present on all hooks. If the latch is missing the latch must be tagged and removed.
20. If there has been a slack rope condition, determine that the rope is properly seated on the drum and in the sheaves prior to lifting.
21. Keep hands away from pinch points as the slack is being taken up.
22. Leather gloves are recommended when handling wire rope.
23. Avoid impact loading caused by sudden jerking when lifting or lowering. Lift the load gradually until the slack is eliminated.
24. Never ride on a load that is suspended.
25. Avoid allowing the load to be carried over the heads of any personnel.
26. Never work under a suspended load until the load has been adequately supported from the floor and all conditions have been approved by the supervisor in charge of the operation.
27. Never leave a load suspended unless emergency evacuation is required.
28. Never make temporary repairs to sling.
29. The capacity of a sling is determined by its angle, construction, type of hitch and size.
30. Never lift loads with one leg of a multi-leg sling until the unused legs are made secure.
31. Never point load a hook unless it is especially designed and rated for such use.
32. Make certain that the load is broken free before lifting and that all legs are taking the load.
33. When using two or more slings on a load make certain all slings are made from the same materials.
34. Lower the loads on to adequate blocking to prevent damage to the slings.
35. Materials and equipment being hoisted must be loaded and secured to prevent any movement which could create a hazard in transit.
36. The weight of the hook, load block and any material handling devices shall be included when determining crane capacity.
37. Calculated weights cannot exceed 75% of the chart without written approval.

**Note 1:** When calculating load weight, two independent people shall do calculations. Calculations should be within 5% of each other.

**Note 2:** When lifting used or formerly in-service equipment, on-site external and internal (if possible), inspection is required to validate calculation basis.

38. Chains should not be used for lifting in place of slings. Chain hoists and come-a-longs may be used for lifting.
39. All wire rope sling eyes shall be made with flemished splice and compressed steel swaged sleeves.
40. Sling eyes shall not be shackled together on lifting hook to prevent spreading. Slings should be placed in a shackle of sufficient size and the shackle shall be placed with the pin on the hook.
41. Rigging equipment, when not in use shall be removed from the immediate work area.  
Rigging equipment shall be inspected to ensure it is safe. Rigging equipment for material handling shall be inspected prior to use on each shift and as necessary during its use to ensure that it is safe.

### **Additional requirements of synthetic slings;**

1. Synthetic slings shall be marked to show the rated capacity for each type of hitch and type of web material.
2. Nylon web slings shall not be used where fumes, vapors, sprays or mists or liquids of acids or phenolics are present. Web slings with aluminum fittings shall apply in this category.
3. Synthetic web slings shall be removed from service and destroyed if any of the following conditions are present:
  4. Acid or caustic burns
  5. Melting or charring of any part of the sling surface
  6. Snags, punctures tears or cuts
  7. Broken stitches
  8. Distortion of fittings
9. Synthetic web slings of polyester or nylon shall not be used at or come in contact with temperatures in excess of 180 degrees F.
10. Polypropylene web slings shall not be used at or come in contact with temperatures in excess of 200 degrees F.
11. Insulated hooks shall be tested yearly to insure insulation integrity to at least manufacturer's specifications.

### **Requirements of plate clamps:**

1. The rated load of the plate clamp shall be marked on the main structure.
2. Care should be taken to make certain the load is correctly distributed for the plate clamp being used.
3. Do not allow load or plate clamp to come into contact with any obstruction.
4. The plate clamp shall not be used for side pulls or sliding the load.
5. When lifting stainless steel or special alloys, ensure plate clamp is designed for use on the specific metal.

### **Signal Person**

Riggers are frequently required to act as a signal person for equipment operators. Whenever the operator is obstructed in his view of the path of travel of any part of the equipment, it's load or components; a qualified signal person shall be stationed:

- In full view of the operator or accompanying signal person.

- With full view of the intended path of travel of the equipment, load or components, yet clear of the intended path of travel.
- Keep all unauthorized personnel outside the radius of the operation.
- Direct the load so that it does not pass over anyone.

### **Rigging Crew:**

- The rigging crew must be capable of 1) selecting tackle and lifting gear suitable for the load to be lifted, 2) directing the safe movement of the load, and 3) maintaining full load control.
- The Rigging Crew shall:
- Review the planned operation and requirements with the job supervisor or PIC of lift.
- Know and never exceed the safe working load of the equipment and tackle to be used.
- Confirm the total load weight or confirm the maximum load weight is less than the capacity of the rigging equipment.
- The weight of the hook, load block and material handling devices shall be included when calculating the total weight of a load.
- Examine all hardware, equipment, tackle and slings before using.
- Report unsafe or unsuitable equipment or tackle to the job supervisor.
- **CAUTION: Defective components which cannot be repaired should be destroyed.**
- Recognize and make appropriate allowances for the factors that can reduce the capability of the equipment.
- Personal Protective Equipment (PPE)
- PPE shall be used in accordance with the Company's Policy.

### **Inspection**

Each sling used by the Company shall be inspected prior to each use.

Wire rope slings shall be removed from service immediately if any of the following conditions are present:

1. Ten (10) randomly distributed wires broken in one (1) rope lay, or five (5) broken wires in one (1) strand in one (1) rope lay.
2. Wear or scraping of one-third the original diameter of outside wires.
3. Kinking, crushing, bird caging or any other damage resulting in distortion of the wire rope structure.
4. Evidence of heat damage.
5. End attachments that are cracked, deformed worn.
6. Corrosion of the rope or end attachments.
7. Metal mesh slings shall be immediately removed from service if any of the following conditions are present:
8. A broken weld or broken brazed joint along the sling edge.
9. Reduction in wire diameter of 25 percent due to abrasion or 15 percent due to corrosion.
10. Lack of flexibility due to distortion or corrosion.
11. Synthetic web slings shall be removed from service and destroyed if any of the following conditions are present:
12. Acid or caustic burns
13. Melting or charring of any part of the sling service
14. Snags, punctures, tears or cuts

15. Broken stitches
16. Distortion of fittings

## **Critical Lifts**

A written rigging procedure shall be required for:

- Lifts or movements over 50 tons (100,000 lbs.)
- Erection of process columns, towers or vessels, and turbine/generator systems.
- Lifts over operating units/equipment
- Other instances deemed prudent by the Company.
- Lifts or movements of unusual difficulty or geometry.
- Where required by contract.
- Lifting a Personnel Basket.
- 2 picker operations.
- 75% of crane capacity

## **Critical Lifts shall include:**

- a. Critical Lift Plan
  - b. Drawings to scale
  - c. An equipment list
  - d. Equipment certifications
  - e. Proof load tests
  - f. Lift weights
  - g. Hoisting capacities
  - h. Calculations
- Calculations shall be provided for the following:
    - a. Sling and wire rope safety factor determinations
    - b. Blocks and rigging tackle analysis
    - c. Ground loadings
    - d. Load distribution variations
    - e. Structural details
    - f. Stability analysis (barge off-loadings, soil loadings, etc.)
    - g. Load weight determinations

## **RECORDS RETENTION**

Completed Equipment Lift Record Cards and the associated rigging procedures shall be retained in site files until project completion.



## **Powered Industrial Trucks, Forklifts, Aerial Lifts, Scissor Lifts**

### ***Scope***

The safe operation of forklifts on and around the jobsite is essential. Only trained and authorized persons may operate a powered industrial truck or lifts on our jobsites. This section applies to OSHA's Powered Industrial Truck Standards 1910.178 and 1926.602

### ***Definitions***

**Competent Person:** Employees will satisfactorily answer the forklift operator test as well as demonstrate their ability to safely perform operational skills in operating a forklift.

### ***Training***

Before any person can be authorized to operate any of our lifts, they must earn the designation qualified by being trained by an approved lift trainer.

Gartner Refrigeration will arrange the training for all of our operators yearly and will document the training and will have documentation of training at our jobsite as well.

The Training consists of a combination of formal (lecture, discussion, video (dvd/vhs), written material and a driven demonstration.

#### **Training Topics:**

- Operating instructions
- Warning and precautions for the type of truck/lifts the operator will be authorized to operate
- Differences between the trucks/lifts and the automobile
- Truck/Lift controls and instrumentation (location, what they do, how the work)
- Engine or motor operation
- Steering and maneuvering
- Visibility (including restrictions due to loading)
- Forks/Basket operations, and use limitations
- Vehicle/Lifts capacity
- Vehicle/Lifts stability
- How to do an inspection that the operator will be required to perform
- Refueling and/or charging and recharging of batteries
- Operating limitations
- Workplace related topics
- Ramps and other sloped surfaces
- Surface conditions
- Composition of loads
- Hazardous locations of operation

- Closed environment
- Any additional instruction, warnings or precautions listed in the operator's manual for the type of vehicle being trained to operate.
- Pedestrian traffic

Additional training may be required to operate and perform safe lifts with specialized equipment. All lift operators will be trained on the type of machine they are operating under the conditions they will be expected to operate.

An evaluation of each powered industrial truck or lifts will be done yearly or when operator miss uses the machinery.

### ***Safety Regulations for Operators***

1. Never operate lifts unless trained and authorized to do so.
2. Wear appropriate personal protective equipment when operating lifts.
3. When using forklifts keep arms and legs inside the cab at all times.
4. When using an aerial lift, employees shall stand firmly on the floor and shall not climb on the rails or the edge of the basket.
5. A fall restraint system must be used and attached to the boom or basket when off of the ground.
6. When operating an aerial lift or forklift a minimum clearance between electrical lines and any part of the equipment will be 10'.
7. Inspect lifts daily and before each use.
8. Operate at a safe speed.
9. Do not exceed the rated capacity of lifts.
10. Operator must compensate for shifts in the center of gravity and maintain stability.
11. Always drive a loaded lift with the load on the uphill side.
12. Drive with the load tilted back and the forks raised only enough to clear the road.
13. Block and tie round objects so they don't roll out.
14. Watch for overhead structures.
15. Start/stop slowly to prevent load from shifting.
16. Turn at a safe speed smoothly and gradually.
17. Never raise or lower the load while traveling.
18. Be cautious on wet or slippery pavement.
19. Never refuel with the engine running.
20. Never let a gasoline/propane/diesel engine idle in an enclosed area.
21. Use mirrors mounted at corners and in blind spots to see pedestrians and on-coming vehicles
22. Watch for pedestrians
23. Never allow any person to stand or pass under the elevated portion of any truck, whether loaded or unloaded.
24. Never allow any person to ride in or on the forks on forklifts.
25. Never leave a forklift running while unattended.
26. Make sure the forks on lifts or loaders are on the ground, the brakes are set, the engine is off, and the keys removed.
27. Block/chock the wheels whenever a lift is left on an incline.
28. Never use a forklift as an elevator unless an approved personnel platform with handrails and toe board is securely fastened to the forks.

29. Modifications to the equipment shall not be made without the approval from the manufacturer.  
The approval must be in writing.

### ***Inspection Guidelines***

Lift inspections are required every day and before use. Remember that battery charging installations must be located in areas designated for that purpose.

Before each start-up of the lifts, check the following

- Engine oil level
- Radiator water level/battery level
- Fuel
- Any leaks
- Tires
- Lights
- Horn
- Any warning lights
- Gauges and instruments hour meter
- Steering
- Brakes, parking
- Hydraulic controls
- Any electrical connections
- Secured propane tank(if applicable)
- Condition of forks/baskets
- Check operation of lifting rack by raising and lowering the forks/boom

### ***Safety Regulations for Personnel Platforms***

1. Personnel platforms shall be securely attached to the lifting carriage of forks.
2. Stepping out of the platform without the right methods of PPE is not allowed. You must have PPE attire while in the basket (full body harness and double lanyards and maintain a 100% tie off).

### ***Equipment Inspections***

All operators are required to regularly inspect their equipment. Gartner Refrigeration employees must do a daily inspection and document and turn in at the end of the working week. Below are some common items that need to be included within a typical daily inspection.

- **Check engine oil**
  - ☐ Make sure that the oil level is within the full range.
  - ☐ Make sure that proper oil is added. Do not overfill.
  - ☐ Report equipment consuming an unusual amount of oil.
- **Check the radiator**
  - ☐ Check fluid level. NEVER OPEN WHILE HOT! Check in the morning.
  - ☐ If fluid is low, fill to the indicator level. Do not overfill.
  - ☐ Check for leaks.
  - ☐ Check for missing guards.
  - ☐ Report overheating.

- **Check the battery level**
- **Check hydraulic oil**
  - ❑ Bleed off pressure before opening hydraulic tank.
  - ❑ Only add the proper fluid.
  - ❑ Do not overfill.
- **Check transmission fluid**
  - ❑ Check the transmission oil level with the engine running at low idle.
  - ❑ Only add proper fluid.
  - ❑ Do not overfill.
- **Undercarriage**
  - ❑ Inspect sprockets, idlers, rollers, for damage or wear.
- **Hydraulic cylinders**
  - ❑ Check for leaking seals.
  - ❑ Inspect pins, bushing, and bearing.
- **Fuel system**
  - ❑ Use proper fuel.
- **General walk around**
  - ❑ Inspect instruments and mirrors.
  - ❑ Inspect lights.
  - ❑ Inspect warning lights.
  - ❑ Check for any leaks.
  - ❑ Check tires and tire pressure.
  - ❑ Check for cracks.
  - ❑ Check for damaged components.
  - ❑ Check for missing or damaged guards.
  - ❑ Check for leaking brakes.
  - ❑ Check to make sure that the seatbelt is functioning properly.
  - ❑ Check for leaking or frayed hydraulic hoses.
  - ❑ Check to see if the reverse alarm is operating properly.
  - ❑ Check to see if the horn is operating properly.
  - ❑ Check gauges and instruments – hour meter.
  - ❑ Check for any loose electrical connections.
  - ❑ Check steering controls.
  - ❑ Check for and replace any damaged warning placards and signs.
  - ❑ Grease and lube machine thoroughly.
  - ❑ Check air filters.
- **Housekeeping**
  - ❑ Keep your equipment clean!
  - ❑ No accumulation of mud, grease, and oil on foot/hand holds is allowed to control slip hazards climbing in/out of machine.
  - ❑ Do not let debris accumulate in the cab. Throw away all garbage at the end of your shift
  - ❑ Do not let cans roll around in your cab. Debris can get stuck under the pedals and not allow them to function properly.
  - ❑ Do not throw trash under the seats. This can affect the function of the seats suspension
  - ❑ Keep windows clean.
  - ❑ DO NOT stand on hydraulic hoses to clean the rear window.





## ***SOP - Hazardous Material Spill Prevention & Response Plan***

This spill plan is designed to handle the requirements for a job site and associated hazardous materials and should be updated if the hazardous material inventory changes.

### **Spill Prevention**

The following are general requirements for any hazardous materials stored or used on a Gartner Refrigeration jobsite.

### **General Requirements**

1. Ensure all hazardous substances are properly labeled.
2. Store, dispense, and/or use hazardous substances in a way that prevents releases.
3. Provide secondary containment when storing hazardous substances in bulk quantities (~55gl).
4. Maintain good housekeeping practices for all chemical materials at the facility.
5. Routine/Daily checks in the hazardous material storage area to be performed by the field superintendent.
6. Monthly inspections of the hazardous material storage area, secondary containment, and annular space (interior cavity of double wall tank) on any present Above-ground Storage Tanks (AST) or Underground Storage Tanks (UST) need to be logged in.

### **Spill Containment**

The general spill response procedure at a jobsite is to stop the source of the spill, contain any spilled material, and clean up the spill in a timely manner to prevent accidental injury or other damage.

Small spills will be contained by site personnel if they are able to do so without risking injury. Spill kits must be adequate for any anticipated spills and their locations should be outlined on a site map.

**Personnel will ensure that used spill cleanup materials are properly characterized before disposal.**

### **Emergency Procedures**

- Immediately call **911** in the event of injury, fire or potential fire, or spill of a hazardous substance that gives rise to an emergency situation.
- If a spill has occurred, contact the following persons immediately:
  - \_\_\_\_\_ **(Primary)** ( ) -
  - \_\_\_\_\_ **(Secondary)** ( ) -
  - \_\_\_\_\_ **(After Hours Emergency Contact)** ( ) -

- **In the event of a large spill, a properly trained employee should:**
  - Notify the primary and/or secondary contact from the list above. Continue your spill response. The primary contact at this time should assess additional notification requirements
  - Retrieve the spill kit from the closest location.
  - Assess the area for any immediate dangers to your health or safety (i.e. a wrecked car on fire). If any dangers are present, move away from the area, **call 911**.
  - Assess the size of the leak and any immediate threat of the spill reaching the floor/storm drains or permeable surfaces in the area. If there is an immediate threat and there are no safety concerns, then attempt to block the spill from coming in contact with the floor/storm drain or permeable surface. If no drain covers are available, then try to use absorbent (cat litter) and/or sock booms or rags to stop the spill from getting into the drains or to any permeable surfaces.
  - If there is no immediate threat to the floor/storm drains or permeable surfaces, or after controlling the spill, try to plug or stop the leak, if possible. If applicable, put on protective gear (gloves, goggles, protective clothing, etc.) and plug the leak.
  - If the spill can be contained with absorbent booms, deploy them around the spill. Use the booms to direct the spill away from any immediate hazards (i.e. a wrecked car).
  - Once the spill has been contained and any immediate threat to storm drains or permeable surfaces has been minimized, contact the spill cleanup contractor and dispatch them to clean up the spill or commence spill cleanup procedures.

OPTIONAL: Spill cleanup for large spills should be handled by the Spill Cleanup Contractor that should be located near the jobsite. Their phone number should be posted.

## **Plan Management**

The primary contact, or their designee, shall administer this plan and will be responsible for updating and including any required documentation.

## **Training**

All personnel that may respond to a spill, large or small, need to be trained on the contents and procedures in this plan. Trained personnel will add their name, date of training, and phone number are to be entered into the Training Log. Only persons trained on this plan shall respond to a spill. If you are not trained and witness a spill, call or notify the job superintendent.

## **Spill Tracking**

Any spills must be entered into the Spill Log. If a large catastrophic spill occurs, attach additional pages to describe the event. Include known or possible causes, areas affected, and effectiveness of the cleanup. Include a review of the cleanup contractor and their procedures. For small spills, it is sufficient to fill out the Spill Log, and to take measures to prevent a repeat occurrence.

## **Facility Inspections**

Routine inspections will be conducted daily during regular business hours on standard business days. Daily inspections will include, at a minimum, a visual inspection of the hazardous materials containers and the area immediately adjacent to it for signs of a spill or leak. These inspections do not need to be logged unless a spill or leak is detected. Ideally, this inspection will be conducted by a manager or by regular employees.

Full site inspections will be conducted monthly by the field superintendent or their designee and will include, at a minimum, those items which have been designated as hazardous. The inspection form will be attached to this plan unless all items are deemed “acceptable”; in this case it is sufficient for the inspector to only log the inspection and the results in the Inspection Log.

## **Spill Reporting**

If a hazardous substance has been released to soil, surface water, storm drains or the spill exceeds 25 gallons the proper agencies should be contacted. A list of the local and national agencies and response centers should be posted including their phone numbers.



## Driving Safety

Gartner Refrigeration & Mfg., Inc. has made a commitment of safety, service, and quality to both our employees and customers. Gartner Refrigeration & Mfg., Inc. mandates that our employees operate all vehicles owned by or used by Gartner Refrigeration & Mfg., Inc. in a safe and economical manner. Policy guidelines are summarized by the following:

1. Operate vehicles in a manner consistent with the Driving Policy of Gartner Refrigeration & Mfg., Inc.
2. Vehicles are not to be operated unless in a safe operating condition. Report vehicle defects and needed repairs to the Service Manager so necessary repairs can be made.
3. Vehicle selection shall be based on size and quantity of people and materials to be transported. Do not exceed manufacturer recommended weight limits.
4. Drivers must be physically and mentally able to drive safely.
5. Cell phone use is permitted while driving where state laws allow. It is highly recommended that a hands-free device be used while in operation of a company vehicle.
6. Ensure safe following distance from other drivers based on vehicle performance and loads.
7. Always limit distractions while driving, focus on the road and surrounding conditions.
8. Drivers must conform to all traffic laws with allowances made for adverse weather and traffic conditions.
9. All traffic violations received while operating the assigned vehicle will be paid by the employee.
10. Respect the rights of other drivers and pedestrians. **Courtesy is contagious.**
11. Drivers may not use drugs or alcohol while operating a vehicle owned by or used by Gartner Refrigeration & Mfg., Inc.

## Accidents

All accidents are to be reported to the Office Manager or Safety Manager at Gartner Refrigeration & Mfg., Inc. within twenty-four (24) hours after the accident occurs. All accidents will be reviewed and determination made as either preventable or non-preventable. A preventable accident is defined as an accident in which the driver failed to do everything reasonably possible to avoid it.

## Traffic Violations

All traffic violations obtained while operating company vehicles are to be reported to the Office Manager or Safety Manager at Gartner Refrigeration & Mfg., Inc. within twenty-four

(24) hours after the incident has occurred. All traffic violations received while operating a company vehicle will be the responsibility of the employee who received the violation.

## **MVR Standards**

Motor Vehicle Records (MVR) will be checked annually on all employees where driving is a part of their job description. The MVR will be reviewed to ascertain the employee holds a valid license and their driving record is within the parameters set by company management. MVR checks will reveal:

1. Three (3) or more traffic violations over a three (3) year period for drivers age 25 and older, two (2) traffic violations for drivers between ages of 18 and 25, or one (1) traffic violation for drivers 17 and under; or
2. One of the following type of traffic convictions:
  - Driving while intoxicated or while disabled by use of drugs
  - Refusal to take a breath analyzer test
  - Two or more preventable accidents in a twelve (12) month period
  - Fleeing the scene of an accident
  - Homicide or assault arising out of the operation of a motor vehicle, or criminal negligence in the operation of a motor vehicle resulting in death;
  - Driving while license is suspended or revoked
  - Reckless or dangerous driving which results in injury to a person
  - Racing
  - Passing a stopped school bus

May disqualify the employee from driving company operated vehicles, or those vehicles in the care and custody of Gartner Refrigeration & Mfg., Inc.

"Traffic violation" includes seat belt violation, but does not include such non-moving violations as weight violations or improper or inadequately maintained equipment.

The number of convictions "allowed" will be reduced by one for each at-fault accident of the particular driver.

## **Passengers**

Specific permission must be obtained from Company management for any personal use of the vehicle.

## **Seat Belts**

Seat belts must be worn by all occupants whenever the vehicle is in motion.

## **Securing Cargo**

Cargo will be secured and all doors locked while enroute and while the vehicles are parked. Loads shall be secured in a neat and workman like fashion and not to exceed manufacturer recommended limits.



## **Accident Investigation Program**

### **Purpose**

Accident prevention and control of hazards is the result of a well-designed and executed safety and health program. One of the keys to a successful program includes unbiased, prompt and accurate accident investigations. The basic purpose of these investigations is to determine measures that can be taken to prevent similar accidents in the future. This chapter addresses:

1. Company Policy
2. Responsibilities
3. Hazard Control
4. Role of Supervisors
5. Investigation Procedures
6. Lessons Learned

### **Policy**

It is the policy of Gartner Refrigeration & Manufacturing that investigation of all work related accidents, injuries and illnesses are to be conducted in a professional manner to identify probable causes and are used to develop specific management actions for the prevention of future accidents. All accidents are considered severe and will be reviewed thoroughly to determine the root cause and corrective actions will be implemented to reduce the risk of repeating the incident in the future. All employees will be trained specific to their responsibilities during an accident investigation as well as given an orientation on the equipment needed to complete a thorough investigation.

### **Responsibilities**

#### **Safety Director/Project Management**

- Conduct accident prevention and investigation training for supervisors
- Ensure all accidents and injuries are properly investigated
- Ensure immediate and long term corrective actions are taken to prevent reoccurrence
- Maintain Accident Reports permanently on file
- Ensure proper entries are made on the OSHA 300 Log and First Report of Injury
- Provide all necessary medical care for injured workers
- Notify applicable regulatory agencies within specified time limits (8 hours for regulatory agencies and 24 hours for facility/client)

## **Supervisors**

- Conduct immediate initial accident investigations
- Report all accidents to the safety director as soon after the event as possible, maximum of 24-hours
- Collect and preserve all evidence that may be useful in an investigation
- Conduct interviews of witnesses in a polite professional manner, individual if possible
- Do not attempt to find or assign blame for accidents
- Take action to protect people and property from secondary effects of accidents

## **Employees**

- Immediately report all accidents & injuries to their supervisor
- Assist as requested in all accident investigations
- Report all first aids, hazardous conditions, and near-misses to supervisors

## **Hazard Control**

**Engineering Controls** - There are numerous engineered safeguards throughout the company used to protect employees and prevent exposure to hazards. Examples of engineering controls are machine guards, safety controls, isolation of hazardous areas, monitoring devices, etc. Specific engineering controls are addressed in other chapters of the company safety manual and in equipment and process procedures.

**Administrative Controls** - These controls involve the use of procedures, assessments, inspection, records to monitor and ensure safe practices and environments are maintained. Other administrative controls are in place to identify new hazards and implement corrective action. Examples of administrative controls are periodic inspections, equipment operating and maintenance procedures, hazard analysis, selection and assignment of personal protective equipment, etc.

**Training Controls** - This aspect of hazard control is used to ensure employees are fully and adequately trained to safely perform all tasks to which they are assigned. No employee is to attempt any task without proper training in the equipment used, required personal protective equipment, specific hazards and their control and emergency procedures. Examples of training controls are initial new hire safety orientation, job specific safety training and periodic refresher training.

## **Supervisor Involvement**

In most cases, the immediate area supervisor will conduct the initial phase of an accident investigation. This initial activity is primarily a recording of facts involved in the accident, list of affected employees and witnesses. Direct supervisors are familiar with employee's

work environment & assigned tasks. Supervisors must take the accident situation under control and immediately eliminate or control hazards to others.

### **Immediate Steps**

1. Provide First Aid for any injured persons.
2. Eliminate or control hazards
3. Document accident scene information to determine the cause
4. Interview witnesses immediately, obtain a signed account of the incident from witnesses

### **Accident Prevention**

Accidents are usually complex. An accident may have 10 or more events that can be causes. A detailed analysis of an accident will normally reveal three cause levels: basic, indirect, and direct. At the lowest level, an accident results only when a person or object receives an amount of energy or hazardous material that cannot be absorbed safely. This energy or hazardous material is the **DIRECT CAUSE** of the accident. The direct cause is usually the result of one or more unsafe acts or unsafe conditions, or both. Unsafe acts and conditions are the **INDIRECT CAUSES** or symptoms. In turn, indirect causes are usually traceable to poor management policies and decisions, or to personal or environmental factors. These are the **BASIC CAUSES**.

Most accidents are preventable by eliminating one or more causes. Accident investigations determine not only what happened, but also how and why. The information gained from these investigations can prevent recurrence of similar or perhaps more disastrous accidents. Accident investigators are interested in each event as well as in the sequence of events that led to an accident. The accident type is also important to the investigator. The recurrence of accidents of a particular type or those with common causes shows areas needing special accident prevention emphasis.

### **Initial Investigation Procedures**

The initial investigation has three purposes:

1. Prevent further possible injury and property damage
2. Collect facts about the accident
3. Collect and preserve evidence

#### **Steps**

1. Secure the area. Do not disturb the scene unless a hazard exists.
2. Prepare the necessary sketches and photographs. Label each carefully and keep accurate records.
3. Interview each victim and witness. Also interview those who were present before the accident and those who arrived at the site shortly after the accident. Keep accurate records of each interview. Use a tape recorder if desired and if approved. Obtain individual signed witness statements that describe the event in the eyes of the witness.



**Determine**

1. What was not normal before the accident.
2. Where the abnormality occurred.
3. When it was first noted.
4. How it occurred.

**Follow-up Accident Investigation**

The follow-up investigation is used to analyze data and determine the causes and corrective actions necessary to prevent reoccurrence.

**Steps**

1. Analyze the data obtained in the initial investigation
2. Repeat any of the prior steps, if necessary.
3. Determine
  - a. Why the accident occurred.
  - b. A likely sequence of events and probable causes (direct, indirect, basic).
4. Determine the most likely causes.
5. Conduct a post-investigation briefing.
6. Prepare a summary report, including the recommended actions to prevent a recurrence.

An investigation is not complete until all data are analyzed and a final report is completed. In practice, the investigative work, data analysis, and report preparation proceed simultaneously throughout the investigation process.

**Lessons Learned**

Upon completion of the incident report, all employees will receive a copy of the root cause analysis. Corrective actions will be implemented to reduce the risk of repeating the accident in future work activities.



## **Manual Material Handling**

### **Purpose and Background**

The purpose of this safety policy and procedure is to establish guidelines and procedures for implementing the Gartner Refrig & Mfg. Back Protection Program. Back injuries represent the most common type of workers' compensation claim. Jobs within our company with high rates of back injuries tend to be those requiring a great amount of manual load handling. Eliminating and/or minimizing back injuries can result in lower workers' compensation costs and promote the well-being of employees. It is the policy of our company to provide a place of employment that is free from recognized hazards that cause or are likely to cause death or serious physical harm to employees or the public. Therefore, management will administer a back protection program and at risk employees will receive the required training. When lifting hazards exist that cannot be eliminated, then engineering practices, administrative practices, safe work practices, Personal Protective Equipment (PPE), and additional training regarding Back Protection will be implemented. These measures will be implemented to minimize those hazards to ensure the safety of employees and the public.

### **Scope**

This program applies to all departments and any employee that may conduct manual handling tasks as part of their job responsibility. This program is intended to minimize the potential for a back injury caused by lifting heavy objects. Employees should not lift any object 80 pounds or greater without assistance. All employees whose work requires heavy lifting shall be properly trained, physically qualified, and receive a medical evaluation as required by the job description.

### **Policy**

This program has the following objectives:

1. Ensuring employees are not required to manually lift materials or objects greater than 80 pounds as part of their job functions
2. Assist in identifying, assessing, and controlling risks associated with manual handling tasks
3. Reducing the incidence of manual handling injuries
4. Establishing an effective system for manual handling

## Responsibilities

**Project Manager** - Responsible for ensuring that adequate funds are available and budgeted for the purchase of equipment and supplies to aid in minimizing lifting related back injuries. They will also be responsible for identifying the employees affected by this safety policy and procedure. The project manager will obtain and coordinate the required training for the affected employees and also ensure compliance through their auditing process.

**Supervisors** - Supervisors will be responsible for communicating appropriate needs to the safety manager and/or supervisors. Supervisors will ensure that employees are properly trained before using lifting belts and that they are being worn properly. Supervisors will ensure that no employee is required to lift beyond his or her capabilities. Supervisors will periodically inspect site conditions and instruct employees of any changes that must be made when handling material. Upon request, employees are to receive assistance in lifting.

**Employees** - Employees are to report any unsafe act associated with this policy to their supervisors. Employees are to report any injury to their immediate supervisors immediately. Employees that are assigned lifting belts are to maintain them and have them replaced when torn or frayed.

**Safety Department** - Safety Department will provide prompt assistance to project managers, supervisors, or others as applicable on any matter concerning this safety policy and procedure. Safety will assist in developing or securing the required training and will provide *Back Safety* training at the request of project managers and supervisors. Safety will also work with Purchasing Departments ensure that all newly purchased lifting related equipment and supplies comply with current safety regulations. Additionally, Safety will provide consultative and audit assistance to ensure effective implementation of this safety policy and procedure. Lastly, Safety will investigate the root cause of all injuries received while engaging in manual lifting and determine corrective actions that will be incorporated into future manual lifting activities.

## General Lifting Techniques

Whether it is during leisure activities or as a part of paid work, everyone lifts, holds, carries, pushes and pulls on a daily basis. Manual material handling involves lifting light, heavy and awkward objects. Safe lifting is a critical aspect of daily activities and should be the focus of any manual material handling. Before you lift, remember the following:

- Wear supportive shoes
- Use lift assist devices (hand dollies, carts, lift tables, forklifts)
- Carry all movements out horizontally (e.g., push and pull rather than lift and lower)
- Always use your body weight and not your feet when pushing
- Try to have most workplace deliveries placed at hip height
- Always keep objects in the comfort zone (between hip and shoulder height)
- Keep all loads close to and in front of the body
- Keep the back aligned while lifting
- Maintain the center of balance

- Let the legs do the actual lifting
- Reduce the size of the material to keep it light, compact and safe to grasp.

## **PLAN THE LIFT**

- Size up the load, its weight, shape and position
- Determine if the load is too large, too heavy or too awkward to move alone
- Get help from a coworker or use a mechanical aid device to help with the lift when necessary
- Decide on the route to take
- Check for any problems or obstacles such as slippery or cluttered floors
- Investigate the location where the load is going to be placed in order to anticipate any difficulties
- Always exercise or warm-up the back prior to lifting

## **SQUAT LIFTING** should be done for a majority of all lifts

- Stand as close to the load as possible
- Move your feet shoulder width apart
- Tighten your stomach muscles so you can tuck your pelvis
- Bend at the knees, keeping your back straight and stomach tucked
- Get a good firm grip on the load
- Hug the load close to the center of your body
- Lift smoothly with your legs gradually straightening the knees and hips into a standing position
- Avoid twisting your body as you lift

## **CARRYING LOADS**

- Keep the load close to the center of your body to take full advantage of the mechanical leverage of your body
- Do not change your grip on the load unless it is weight supported
- Avoid twisting your body without pivoting your feet at the same time
- If you must change direction, move your feet in that direction instead of twisting your trunk in that direction
- Make sure you can see over the load
- Move carefully toward your destination
- If a heavier load is carried for some distance, consider storing it closer

## **UNLOADING OBJECTS**

- Slowly bend your knees to lower the load
- Keep your back straight and the weight close to the center of your body
- Allow enough room for fingers and toes when the load is set down

- Place the load on a bench or table by resting it on the edge and pushing it forward with your arms and body
- Secure the load to ensure that it will not fall, tip over, roll or block someone's way

**ONE-ARM LOADS** are used when carrying items such as pails, buckets or tool bags.

- Bend the knees and at the waist keeping your back straight
- Reach for the load
- Grasp the handle of the load firmly
- Lift with your legs not your shoulders and upper back
- Keep your shoulders level while switching hands regularly to reduce overexertion on one side of the body while carrying the load

**TEAM LIFTS** are used when objects are too heavy, too large or too awkward for one person to lift.

- Work with someone of similar build and height, if possible
- Choose one person to direct the lift (e.g., "lift on the count of three")
- Lift with your legs and raise the load to the desired level at the same time
- Always keep the load at the same level while carrying
- Move smoothly and in unison
- Set the load down together

## **OVERHEAD LIFTS**

- When lifting or lowering objects from above the shoulders, lighten the load whenever possible
- Stand on something sturdy such as a step stool or platform to decrease the vertical distance
- When you are lowering objects from above the shoulders, slide the load close to your body, grasp the object firmly, slide it down your body and proceed with your move.

## **Mechanical Aids**

Alternative material-handling techniques for carrying or moving loads are to be used whenever possible to minimize lifting and bending requirements. These alternate techniques include the use of: hand trucks, carts, dollies, forklifts, hoists and wheelbarrows. Although mechanical aids are used, safe lifting procedures should still be followed by maintaining the natural curvature of the back, using the legs for any lifting that is encountered and avoid twisting the back. Before engaging in the use of mechanical aids ensure all required training has been completed prior to using equipment.

## **Lifting Restrictions**

When employees are not able to conduct their task fully due to an injury, they could be placed on work restrictions that may contain weight or lifting restrictions. If an employee is placed on any weight restrictions, they may not handle or lift any object heavier than what

they have been restricted to until they are cleared to return to normal duties. If a re-evaluation has been conducted and the weight restriction has been modified or lifted the employee must follow the new restrictions.

### **Work Restrictions – Return to work**

One aspect of the medical management of an injury is determination of appropriate activity. When an employee is seen by their primary care physician, they may be given certain restrictions regarding physical activity. Employees are to follow those restrictions. The restrictions will be readdressed each time they are seen by their primary care provider. Please note that in most cases, continuing usual activity with some restrictions leads to a better outcome than severely limiting activity. When conditions have improved enough, the restrictions will be lifted. If employees have experienced a non-work related injury, they will receive care from their primary care provider, or another health care professional. Employees should follow the treatment regimen of their providers. Supervisors should be promptly notified of any work restrictions given by the primary care physician.



## **Compressed Air**

The purpose of this safety policy and procedure is to establish procedures for the protection of Gartner Refrigeration & Mfg. employees working with or on compressed air equipment.

### **Background**

Air compressors are used for a variety of applications. Air compressor storage tanks store excess air that is generated from the compressor, providing a convenient and readily accessible air source. Because of the air pressure within these storage tanks, potential dangers can develop if certain practices and precautions are not followed.

This safety policy and program provides guidelines for the safe use of air compressor storage tanks. It lists training requirements, guidelines for locating drains and traps, and requirements for gauges and valves.

### **Responsibilities**

#### **Management**

- Ensure adequate funds are available for the purchase and repair of necessary air compressor storage tanks. Identifying and list employees affected by this safety policy and procedure.
- Provide training for affected employees.
- Ensure proper use and maintenance of air compressor storage tanks and equipment.

#### **Supervisors**

- Ensure that only those employees who have been trained to work with air compressor storage tanks are allowed to operate such equipment.
- Ensure that equipment needed is available and is in good working condition.
- Ensure damaged equipment is removed from service until repaired and tested.
- Ensure that air compressor storage tanks are inspected every six months
- Provide employees with Personal Protective Equipment (PPE) necessary for their job.

## **Employees**

- Inspect air compressor storage tanks prior to use and note any damage or defects.
- Inspect all hoses and equipment before connecting to any compressed air system.
- Immediately report any damages or defects to their supervisors.
- Empty manual drains and taps on a regularly scheduled basis.

## **Safety Manager**

- Provide prompt assistance to managers, supervisors, or others on any matter concerning this safety policy and procedure.
- Assist in developing required training.
- Coordinate with Purchasing to ensure that all newly purchased air compressor storage tanks comply with current safety regulations.
- Provide consultative service and audit assistance to ensure effective implementation of this safety policy and procedure.

## **Training**

All affected employees will be trained in:

1. The purpose of air compressor storage tanks.
2. The basic operation of air compressor storage tanks.
3. Maintenance requirements of drains and traps.
4. Reading gauges and operating valves.
5. Identifying damage and defects in the storage tanks, hoses or air driven equipment.

This training must be performed upon initial employment and/or job reassignment.

Periodic refresher training shall also be conducted at the discretion of the supervisor or Safety Department.

## **Equipment**

**Drain valves** are installed at the lowest point of an air compressor storage tank to provide for the removal of accumulated oil and water. Drain valves must be opened once a week to purge water build-up unless they are automatically operated traps.

**Drain Traps** are devices, installed on the lowest point of a storage tank, which use venting head pressure to automatically purge the tank from condensed water.



**Gauges and Valves** All air compressor storage tanks must be equipped with a least one safety valve and pressure gauge. Gauges and safety valves will be tested at least every six months to ensure proper operation. No valve of any type shall be placed between the air receiver and its safety valve.

**Accessibility** Air compressor storage tanks must be installed such that all drains, hand holes, and manholes are easily accessible. Air compressor storage tanks shall never be buried underground or located in an inaccessible place.

**Air Powered Equipment** and tools that use compressed air must be inspected before each use. This includes all hoses and connections. Only approved snap-type connectors are permitted on hoses. Use of hose clamps to connect fittings to hoses is not permitted. All hoses must be connected only to approved supply valve locations. Air power equipment must not be connected to any air supply unless the design pressure of the equipment meets or exceeds the supply air pressure.

Temporary reducers may not be installed in any compressed air supply system without approval by the Safety Department. All air-lance/wand equipment must have an automatic hand closure valve that is positioned such that the employee holds the valve open while using the lance/wand. Maximum air pressure for blowdown and cleanup is not to exceed 30 PSI. Goggles are required during air cleaning of facilities or equipment. Other PPE may be required based on the task and tools used.

## **Storage Tank Safety Checks**

1. All drains, handles, and manholes easily accessible.
2. Drain pipe and valve is installed on the lowest point of the air compressor storage tank.
3. Drain valve is opened and frequently drained to prevent the accumulation of excessive amounts of liquids.
4. Air compressor storage tanks have a pressure gauge.
5. Safety valves operate to prevent the internal tank pressure from exceeding 10% above the maximum allowable working pressure of the air compressor tank.



## **Hexavalent Chromium Program**

This program is intended to convey the potential hazards associated with working with hexavalent chromium (aka chromium (VI), hexchrome, Cr (VI)) and to provide a means by which employees can protect themselves, their co-employees, the public and the environment. While significant exposure to hexchrome would not be expected when working at typical construction sites, employees can best protect themselves by being aware of hexchrome concerns and where it might be encountered.

Chromium is a naturally occurring element found in rocks, animals, plants and soil. This naturally occurring form of chromium is called trivalent chromium (chromium +3 or Cr+3) and is an essential nutrient, meaning that the body needs small amounts of it to maintain health. However, other forms of chromium such as hexavalent and elemental chromium are produced by industrial processes and can cause significant health effects.

Hexchrome exposure can occur by inhalation, ingestion and by skin contact. Inhaling hexchrome dust can result in irritation to the nose, causing runny nose, nose bleeds, ulcers and even holes in the nasal wall upon high exposures. Ingesting or eating hexchrome can result in upset stomach and ulcers as well as kidney and liver damage. Skin contact with hexchrome can cause skin irritation and some individuals have allergic reactions to this material. Finally, studies have shown that excessive exposure to this compound may increase the risk of lung cancer.

The greatest potential for exposure to employees is in industrial facilities that are making chromium containing pigments, dyes, inks and plastics as well as chrome plating operations. While construction site exposure potential is significantly less, employees may be exposed to hexchrome when welding on stainless steel or chromium alloys or conducting hot work on paints or coatings that contain chromium pigments. Another potential source is contact with portland cement which may have small amounts of hexchrome as a contaminant.

### **Applicable Regulation**

OSHA 1926 CFR 1926.1126 Chromium (VI)

## **Exposure Assessment**

### **Initial Determination:**

Each project shall determine whether the potential for hexchrome exposure exists prior to the start of work. Potential sources of hexchrome exposure may be identified in the owner specification or related documents. Information related to Hazard Communication should be reviewed in detail. References to coated or painted steel that involves hot work such as torch cutting, welding, brazing, or other application of heat shall be considered potential flags as would any hot work operation on stainless steel or other unidentified metal alloys or mixtures.

Additionally, a survey of the project site should be conducted to ensure that other potential sources are identified prior to work commencing. Ongoing assessment must be conducted as surfaces not visible at the start of a project may become apparent as work progresses.

If the initial determination establishes that hexchrome may be present in coatings or paints, paint chip samples shall be collected and forwarded to an accredited laboratory for analysis. The presence of hexchrome at detectable levels establishes the need for exposure monitoring as described below. Stainless steel surfaces, by definition, contain hexchrome and working on such surfaces utilizing hot methods also requires exposure monitoring.

Activities that may result in chromium exposure:

- Demolition or salvage of structures where chromium or materials containing chromium are present
- New construction, alteration, repair or renovation of structures, substrates, or portions that contain chromium or chromium containing materials
- Installation of products containing chromium
- Working with dry or wet portland cement mixtures that contain hexchrome as a contaminant.
- Welding stainless steel pipe or Chromium alloys

### **Initial Exposure Monitoring**

If the presence of chromium has been confirmed in a material, work activities involving that material shall be subject to exposure monitoring. A representative number of employees conducting the activity shall be identified and personal 8 hr Time Weighted Average (TWA) sampling shall be conducted. The employee expected to have the highest potential chromium exposure shall be included in the representative sampling program.

### **Periodic Exposure Monitoring**

Results less than the Action Level (AL) - If initial monitoring indicates that exposures are

below the Action Level of 2.5 ug/m<sup>3</sup>, additional monitoring for employees represented by such monitoring is not required.

Results at or above the Action Level (AL) – If initial monitoring results are equal to or greater than the Action Level of 2.5 ug/m<sup>3</sup>, periodic monitoring for those activities shall be conducted every 6 months. Regulated areas must be established when an employee's exposure is or is expected to be in excess of the PEL. Regulated areas shall be marked with warning signs to alert employees. Access is restricted to "authorized persons".

Results above the Permissible Exposure Limit (PEL) – If initial monitoring results are greater than the Permissible Exposure Limit of 5.0 ug/m<sup>3</sup>, periodic monitoring shall be conducted every 3 months.

If periodic monitoring indicates that an exposure level is below the Action Level, and the result is confirmed by a second monitoring episode conducted at least 7 days later, periodic monitoring for that particular activity may be discontinued.

Additional exposure monitoring shall be conducted when there has been a change in the production process, raw materials, equipment, personnel, work practices, or control methods that are used.

### **Employee Notification**

Employees shall be notified of air sampling results within 5 days of results being received by Gartner Refrigeration & Manufacturing. Sampling results shall be provided to employees by hand delivery at the worksite or by certified letter delivery. If the employee receives the letter by hand, he/she will be required to sign off on the air monitoring results to document that they have received the notification.

In the event that the monitoring indicates that employee exposure is above the PEL, Gartner Refrigeration & Manufacturing shall describe in the written correspondence to the employee the corrective steps being taken to reduce the exposure to less than the PEL. Employees are not permitted to work unrestricted (that is, exposed to) environments that are above the PEL of 5.0 ug/m<sup>3</sup>.

## **Methods of Compliance**

### **Engineering and Work-Practice Controls**

Engineering and work practice controls shall be implemented that reduce and maintain employee exposure to or below the PEL. If Gartner Refrigeration & Manufacturing can demonstrate that such measures are not feasible or sufficient, they shall be used to reduce exposure to the lowest level achievable, and they shall be supplemented by the use of respiratory protection as described in the Respiratory Protection section of this document.

In the event that Gartner Refrigeration & Manufacturing can demonstrate that a process or task does not result in any employee exposure to hexchrome above the PEL for 30 or more days per year, the requirement to implement engineering and work practice controls does not apply to the task and personal protective equipment can be implemented immediately as an exposure control measure.

Employee rotation to different jobs shall not be used as a means of achieving compliance with the chromium standard.

Appropriate engineering controls that may be implemented include but are not limited to:

- HEPA vacuum shrouded scalers and grinders
- HEPA vacuum blasters
- Chemical paint stripping
- Dust collection / ventilation
- Removing paint before burning
- Cleaning with HEPA (high efficiency particulate air) filter vacuums
- Wet methods to remove dust
- Use of long cutting torches to keep employees further away from any fumes that are generated
- Use of local exhaust ventilation equipped with HEPA filtration at the point of fume generation
  - Use of mechanical ventilation to move fumes and dust away from employees
  - Positioning employees upwind or otherwise outside of visible fume or dust clouds.

## **Hexchrome Program**

This document shall be considered the governing compliance program when addressing hexchrome exposure. This will be further supplemented by site-specific programs including the worksite Construction Plan and Gartner Refrigeration & Manufacturing Respiratory Protection Program.

The Construction Plan shall detail:

- All specific elements of the activity
- Engineering and administrative controls
- Respiratory protection
- Personal Protective Equipment (PPE)

PPE shall be furnished at no cost by Gartner Refrigeration & Manufacturing. PPE must be provided when there is a hazard from skin or eye contact. Gloves, aprons, coveralls, goggles,

foot covers etc. Contaminated PPE will be removed at the end of the work shift. Employer must clean, launder, repair and replace protective clothing as needed.

Where work involving hexchrome is subcontracted out, the Subcontractor shall be responsible for providing a Site Specific Compliance Program. This program shall be approved by the RSO, Safety Director, prior to the Subcontractor commencing work.

## **Respiratory Protection**

Respirators shall be handled and worn in accordance with the Respiratory Protection section of this

## **Health and Safety Program**

Respiratory protection shall be provided in the following situations:

- During the installation of engineering and work practice controls designed to control exposures above the PEL
- During work operations such as maintenance and repair activity for which engineering and work practice controls are not feasible
- During work operations where the usage of engineering and work practice controls alone are not adequate to reduce exposures to or below the PEL
- During work operations where employees are exposed above the PEL for less than 30 days per year and Gartner Refrigeration & Manufacturing has elected not to implement engineering and work practice controls to achieve the PEL
- Emergencies

Respirator usage must comply with all aspects of Gartner Refrigeration & Manufacturing's Respiratory Protection Program. When required, they shall be worn, used, stored, cleaned and maintained in a manner consistent with Gartner Refrigeration & Manufacturing Respiratory Protection Program.

Respirator usage shall not be discontinued or modified without the approval of the Project Safety Manager, who will evaluate air monitoring data and other pertinent information prior to downgrading or discontinuing respirator usage.

## **Protective Work Clothing and Equipment**

If an operation poses the potential to result in skin or eye contact with hexchrome, Gartner Refrigeration & Manufacturing shall provide protective clothing and equipment to the employee. Where issued, employees are required to wear this equipment. Such equipment may be required during the initial installation and implementation of engineering and work

practice controls, until monitoring suggests that hexchrome exposure is not a concern.

## **Removal and Storage**

Employees who wear protective clothing to minimize exposure to hexchrome shall comply with the following requirements:

- All protective clothing and equipment shall be removed at the end of the work shift or at the completion of tasks involving exposure to hexchrome
- Hexchrome contaminated clothing shall not be removed from the site, except for by an employee or employee whose job it is to launder, clean or dispose of such equipment
- All potentially contaminated clothing or equipment shall be stored and transported in sealed, impermeable bags or containers and labeled appropriately

## **Cleaning and Replacement**

- Gartner Refrigeration & Manufacturing shall be responsible for laundering, cleaning, repairing or replacing all protective clothing or equipment in order to maintain its effectiveness.
- Hexchrome shall not be removed from clothing by any methods that disperse the material into the air or onto an employee's body. This includes blowing, shaking, slapping or other aggressive means of removal. Vacuuming with a HEPA vacuum would be an acceptable means of removal.
- Any employee involved in laundering or cleaning protective clothing shall be informed of the potential health effects of hexchrome and the need to minimize airborne levels and skin and eye contact.

## **Hygiene Facilities and Practices**

### **Change Areas**

If site conditions require the use of protective clothing or equipment, Gartner Refrigeration & Manufacturing shall provide change areas for employee usage. These areas will be equipped with separate storage facilities for protective work clothing and equipment and for street clothes to prevent cross-contamination.

At no time shall employees leave the job wearing any protective clothing or equipment.

### **Washing Facilities**

Gartner Refrigeration & Manufacturing shall provide washing facilities where employees have potential skin contact with hexchrome. These facilities are supplied with clean water, non-alkaline soap and paper towels.

Employees shall wash exposed skin areas as appropriate to remove dust, cement or other materials. Regardless of whether direct exposure is believed to have occurred, all employees shall wash their hands and face at the end of each shift and prior to eating, drinking, smoking, chewing tobacco or gum, applying cosmetics or using the toilet.

### **Eating and Drinking Areas**

Employees shall not enter eating and drinking areas while wearing protective work clothing or equipment.

All area eating and drinking surfaces shall be kept as free as practicable of hexchrome. This can be accomplished by periodic HEPA vacuuming and/or wet wiping of all horizontal surfaces.

### **Prohibited Activities**

Employees shall not eat, drink, smoke, chew tobacco or gum or apply cosmetics in areas where skin or eye contact with hexchrome may occur.

### **Medical Surveillance**

Gartner Refrigeration & Manufacturing shall make medical surveillance available, at no cost to the employee and at a reasonable time and place, where employees:

- Are occupationally exposed to hexchrome at or above the PEL for 30 or more days per year
- Are experiencing signs or symptoms of adverse health effects associated with hexchrome exposure
- Are exposed in an emergency

### **Frequency of Examination**

Gartner Refrigeration & Manufacturing makes medical examinations available:

- Within 30 days of initial assignment, unless the employee has received a hexchrome related medical exam within the past 12 months
- Annually
- Within 30 days after a licensed health care provider provides a written medical opinion recommending an additional examination
- Whenever an employee shows signs or symptoms of adverse health effects associated with hexchrome
- Within 30 days after exposure during an emergency which results in an uncontrolled



release of hexchrome

- At the termination of employment, unless the last examination that meets the requirement of the standard was less than 6 months prior to the date of termination

## **Contents of Examination**

Hexchrome medical examinations shall include the following:

- Medical and Work History emphasizing
  - Past, present and anticipated future exposure to hexchrome
  - Any history of respiratory dysfunction
  - Any history of asthma, dermatitis, skin ulceration or nasal septum perforation
  - Smoking status and history
- A physical examination of the skin and respiratory tract; and
- Any tests deemed necessary by the examining healthcare provider

Gartner Refrigeration & Manufacturing shall ensure that the healthcare provider is given the following information:

- A description of the affected employees former, current and anticipated duties related to hexchrome
- The employees former, current and anticipated levels of occupational exposure to hexchrome
- A description of the personal protective equipment used or to be used by the employee, including when and how long the employee has used the equipment
- Information from records of employment-related medical examinations previously provided to the affected employee that are currently within the control of Gartner Refrigeration & Manufacturing

Gartner Refrigeration & Manufacturing shall also ensure that the healthcare provider is given a copy of the hexchrome standard.

## **Healthcare Provider Medical Opinion**

The healthcare provider shall provide a medical opinion regarding each examination within 30 days of examining the employee. This medical opinion shall contain the following:

- The providers opinion as to whether the employee has any detectable medical condition that would place the employee at increased risk of material impairment to health from further exposure to hexchrome
- Any recommended limitations on the employee's exposure to hexchrome or on the use of respirators
- A statement that the provider has explained to the employee the results of the medical examination, including any medical conditions associated with hexchrome exposure that require further evaluation or treatment, and any special provisions for protective clothing

or equipment

The healthcare provider shall not reveal to Gartner Refrigeration & Manufacturing specific findings or diagnoses not related to occupational exposure to chromium.

Gartner Refrigeration & Manufacturing shall provide the employee with a copy of the healthcare provider's medical opinion within two weeks of receiving it.

## **Housekeeping**

Housekeeping of the work environment can decrease the potential for hexchrome exposure. Appropriate housekeeping methods include:

- All surfaces shall be kept as free as practical of hexchrome accumulations
- Compressed air shall not be used for cleaning
- Vacuuming is the preferred choice for cleaning, however, wet methods such as washing, wet sweeping, wet shoveling and wet brushing may be used when vacuuming is not practical
- Vacuums will be equipped with HEPA filters and shall be emptied in a manner that minimized the dispersion of chromium into the air

## **Employee Information and Training**

Gartner Refrigeration & Manufacturing shall ensure that all employees are informed regarding the requirements of the hexchrome standard. At a minimum, they should be familiar with the following:

- The contents of the standard
- The purpose and description of the medical surveillance program

This training is in addition to the coverage provided in Hazard Communication training.

## **Recordkeeping Requirements**

### **Air Monitoring**

Gartner Refrigeration & Manufacturing is responsible for maintaining an accurate and complete record of all air monitoring conducted to comply with the requirements of the hexchrome standard. At a minimum, this record shall include:

- Sample dates for all air monitoring
- The operation being monitored
- Sampling and analytical methods being employed and information supporting the accuracy of each
- Number, duration and results of completed samples
- Type of PPE worn during sampling
- Name, social security number and job classification of all employees being represented by the monitoring, indicating which employees were actually monitored

Initial and periodic sampling results shall be stored onsite and at the Corporate Health and Safety Department. All support documentation including field worksheets, Chain of Custody form copies and associated documents shall be stored as part of the exposure monitoring record.

All monitoring records shall be maintained and made available to employees in accordance with 29 CFR 1910.1020.

### **Historical Monitoring Data**

In the event that historical monitoring data was used to determine current exposure to hexchrome, the record shall include data that reflects the following:

- The data were collected using methods that meet the accuracy requirements of the standard
- The processes and work practices that were in use when the historical data were collected are essentially the same as the operation being assessed
- The hexchrome containing material being assessed is essentially similar to the material assessed in the historical information
- The environmental conditions between the current operation being assessed and those present when the historical data were collected are essentially the same.

### **Objective Data**

Gartner Refrigeration & Manufacturing shall maintain a record of all of the objective data that was used to determine employee exposure. This includes the following at a minimum:

- The chromium containing material in question
- The source of the objective data
- The testing protocol and results of testing regarding the release of chromium from the material under typical conditions
- A description of the process, operation or activity and how that supports the determination that was made
- Other data relevant to the process, operation, activity, material or employee exposures

## **Medical Surveillance**

Medical surveillance shall be provided when an employee experiences signs or symptoms of the adverse health effects of Hexavalent Chromium (dermatitis, asthma, bronchitis, etc). Medical evaluations will be provided at no cost to employees. Examinations will be performed by or under the supervision of a physician or other licensed health care professional. Gartner Refrigeration & Manufacturing shall maintain an accurate record for each employee covered by medical surveillance. The record shall include the following:

- Employee name and social security number;
- A copy of the health care provider's written opinion
- A copy of the information provided to the health care providers as required by the standard
- A copy of the employee's training record

## **Responsibilities**

Project Management shall:

- Be required to attend a half day supervisory hexchrome safety training course
- Assess operations and project conditions in which employees or the general public may be exposed to hexchrome
- Institute engineering and work practice controls whenever feasible to reduce employee exposure to Hexavalent Chromium below 5 µg/m<sup>3</sup>
- Provide all necessary Personal Protective Equipment, respirators, hygiene facilities, etc. for employees performing operations with hexchrome exposure
- Provide training for employees performing operations with potential hexchrome exposure
- Ensure all employees working with hexchrome are familiar with Gartner Refrigeration & Manufacturing's medical surveillance program
- Maintain all employee medical surveillance records and hexchrome monitoring records

The Employee shall:

- Take part in hexchrome field training safety training prior to taking part in any operation involving hexchrome exposure
- Follow up on procedures or work plans established by their supervisors for working with hexchrome exposures
- Use all personal protective equipment issued to them for use when working with hexchrome exposures
- Take part in the project's medical surveillance program when working with hexchrome exposures



## **Hydrogen Sulfide (H<sub>2</sub>S)**

Employees with Gartner Refrigeration & Manufacturing may have to work near an environment where Hydrogen Sulfide is present. Our employees do not directly work with the chemical, however on rare occasions may be on a job that has Hydrogen Sulfide as part of the processes of the building. Project managers will identify if Hydrogen Sulfide will be present prior to commencing work activities and notify all supervisors of the potential risk when working near the chemical compound.

### **Background**

Exposure to Hydrogen Sulfide occurs in many industries. Most exposures center on the oil and natural gas industries. Hydrogen sulfide is an extremely toxic, flammable gas that may be encountered in the production of gas well gas, high-sulfide high sulfur content crude oil, crude oil fractioning, associated gases, and waters. Hydrogen sulfide is heavier than air, and can collect in low places. As an employee of the company, potential exposure to various forms and amounts of hydrogen sulfide may occur during certain job activities. However, any exposure should be avoided. If an exposure cannot be avoided through ventilation, etc., proper personnel protective equipment must be used.

Hydrogen Sulfide is a colorless gas at normal temperature and pressure with an odor similar to that of rotten eggs. However, presence of this gas may deaden the sense of smell, so odor alone cannot be used for detection. In cases of extreme low temperature and/or high pressure H<sub>2</sub>S may be a liquid. Permissible Exposure Limit (PEL) for Hydrogen Sulfide is 10 PPM. Hydrogen Sulfide is soluble in water and can ignite in certain concentrations.

Health effects from contact with Hydrogen sulfide can result in serious injury and/or death. Early warning signs can include eye irritations, and effects nerve centers of the brain which control breathing.

### **Procedures**

If it has been determined by the project manager that Gartner Refrigeration & Manufacturing employees may be exposed to Hydrogen Sulfide, an on-site safety orientation will be held to identify the hazardous locations and correct safety procedures to mitigate any contact with the chemical.

Supervisors and employees will use an air monitoring device that will alarm when levels reach 10 PPM. If the alarm sounds all employees must evacuate the area until deemed safe to return. Employees with Gartner will not work an environment that exceeds 10 PPM of Hydrogen Sulfide.